

A review of Australian long-horned caddisflies in the *Oecetis pechana*-group (Trichoptera: Leptoceridae), with descriptions of thirteen new species

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Abstract

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This final paper in a series reviewing Australian members of the long-horned caddisfly genus *Oecetis* McLachlan (Trichoptera: Leptoceridae) deals with 21 species, 13 of them new, and all assigned here to the *pechana*-group, so-named for the most common and widespread of Australian *Oecetis* species. This group is diagnosed as having fork 1 in the forewing sessile and, in the male, scale patches on the forewing and a single internal paramere in the phallus, although in several species one or other of these male features is absent. Keys are given to the *Oecetis* species groups recognised in Australia and to species in the *pechana*-group. Established *pechana*-group species are diagnosed and new species are described. Male genitalic features are illustrated for all species save *O. lurida* Kimmins which was described from a female and is probably a doubtful name. A homonym created in the name *O. dilata* Wells, 2004 is replaced with the name *Oecetis kimberleyensis* nom. nov., and *Oecetis cepaforma* Wells, 2004 is synonymised with the widespread Oriental-Australian *O. hemerobioides* McLachlan, 1866. Seventy-four *Oecetis* species are now recognised in the Australian fauna.

Keywords

Taxonomy, Trichoptera, Leptoceridae, *Oecetis pechana*-group, new species, Australia

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Introduction

Among Australian representatives of the long-horned caddisfly genus *Oecetis* McLachlan (Trichoptera: Leptoceridae), a persistent taxonomic problem has been the precise determination of the scope of the species known as *Oecetis pechana* Mosely, 1953. The name has been applied to almost all *Oecetis* specimens having patches of scales on the male forewing, collected Australia-wide, including the water bodies and even stock watering troughs of the arid inland. However, close inspection of males of many of the putative *O. pechana* specimens reveals a range of forms sharing all or some of a suite of character states. Here the *Oecetis pechana*-group is recognised for a set of 21 species, 13 of which are newly described, and is defined to include a number of species that lack scales on the male forewing, but share other synapomorphies.

Oecetis pechana was described originally from the south-west of Western Australia, and subsequently was redescribed and figured by Neboiss, 1977. Neboiss illustrated his work with new figures of *O. pechana* from Tasmania, showing a key feature of the species: the very elongate phallus. This feature is also seen in a newly recognised species, *O. suteri* sp. nov., but is absent in superficially similar specimens that are recognised here as representing several distinct species. *O. pechana* as defined here is the most common and widespread Australian species in the genus *Oecetis*. Adults vary greatly in size, forewing length of those in the northern regions being as little as half that of southern forms. Such a difference in size range probably reflects differences in growth rates, the life cycles being completed far more rapidly in the warm northern waters than in the cooler southern waters. In support of this contention, larger-sized adults were collected in the southern Mt Lofty Ranges of South Australia, where a main late-spring emergence of adults is followed by low numbers of specimens throughout summer, and none in the cool winter months. In contrast, samples from the north of the Northern Territory contain only small-sized adults and, throughout 14 consecutive months of light trap sampling on the Magela Creek at Jabiru (1991–1992), *Oecetis pechana* adults were collected regularly.

Oecetis pechana is often abundant in lentic water bodies such as farm dams and lakes, the larvae in their tubular sand-grain cases probably scavenging on organic material on the substrate. Similarly, all other *pechana*-group species for which larvae have been associated, have cases built of sand grains, including *Oecetis gilva* Neboiss, 1977. This species also occurs in large populations in some farm dams in the Adelaide Hills, South Australia, and has been taken in large numbers from several lakes in Victoria. *Oecetis gilva* as described by Neboiss lacks scales on the male forewing, although conforming with members of the *pechana*-group in other respects. Indeed, membership of this group is confirmed by the fact that light trap collections referable to *O. gilva* taken at two Victorian lakes include males that have scales on the forewing. Quite conceivably, these are simply variants of *O. gilva*, or even hybrids between *O. pechana* and *O. gilva*. For the present, they are accepted as *O. gilva*.

Thus, the *Oecetis pechana*-group is defined by a suite of character states, not all shared by all members: forewing fork 1 without a footstalk, usually with cross veins, forks and anastomoses marked by darkened membrane and hairs; tibial spur formula 1,2,2; in the male, forewing usually with scale patches, phallus usually with a single internal spine or paramere, never with two, abdomen usually with tergites II–IV darkly sclerotised, and genitalia usually with a small setae-lined pouch on inner dorsal side of inferior appendages; and larvae with tubular to conical or cornucopia-shaped cases constructed of sand grains held together by silk secretion. Species of *Oecetis* in the fauna of New Zealand, New Guinea and Java also share the synapomorphies of these *pechana*-group members.

This is the final work in a series of papers (Neboiss, 1989; Wells, 2000, 2004) revising Australian species of *Oecetis*, and raises to 74 the number of species recorded in this genus in

Australia. The key provided by Wells, 2004 to distinguish males of the five *Oecetis* groups recognised for Australia is reproduced here with slight modifications, and a key to males of *pechana*-group species is given. The name *dilata* applied to an Australian *Oecetis* species by Wells, 2004, thus creating a homonym, is replaced; and the name *Oecetis cepaforma* Wells, made available in the same work is here suppressed in synonymy.

Methods

Material examined is lodged in the collections of Museum Victoria, Melbourne (NMV), the Australian National Insect Collection, Canberra (ANIC), the Queensland Museum, Brisbane (QM) and the Northern Territory Museum of Arts and Sciences, Darwin (NTM). Other abbreviations used here are BMNH (The Natural History Museum, London, UK); MCZ (Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA); ARR is used for the Alligator Rivers region, NT; OSS for the Office of the Supervising Scientist, Darwin (previously at Jabiru); and WTH is an NMV code for the Wet Tropics Heritage area of north-eastern Queensland. In the locality data included with the lists of material examined, the Australian political states are abbreviated as follows: NSW (New South Wales); NT (Northern Territory); Qld (Queensland); SA (South Australia); Tas. (Tasmania); Vic. (Victoria); and WA (Western Australia).

Many of the scaly-winged species in this group are very difficult to distinguish without dissection of the male abdomen or clearing of the male genitalia to determine the length of the phallus and size and shape of the single internal paramere.

Key to males of *Oecetis* species groups in Australia [Modified from Wells, 2004]

1. Abdominal tergite VIII sculptured, expanded and extended distally, forming shield over terminal abdominal segments and genitalia *reticulata*-group (see Neboiss, 1989: fig. 2)
 - Abdominal tergite VIII unmodified 2
2. Wings with veins strongly pronounced, fork 1 without a footstalk (sessile) *longiterga*-group (see Wells, 2004: figs 91, 94)
 - Wings with veins not strongly pronounced, fork 1 with or without footstalk 3
3. Phallus simple, lacking parameres *laustra*-group (see Wells, 2004: figs 18, 46, 59)
 - Phallus with 1 or more internal or external parameres or spines 4
4. Forewing fork 1 sessile, wing lamina often bearing patches of scales (androconia) (fig. 1); phallus usually with a single internal paramere or spine, never with more than 1 spine associated with the phallus (e.g. figs 3, 7, 8) *pechana*-group (see below)
 - Forewing fork 1 stalked, wing never bearing patches of scales; phallus with 1 or more external parameres (spines of the phallosome) *complexa*-group (see Wells, 2000: figs 25, 26–33)

Key to males of the *Oecetis pechana*-species group in Australia

[excluding *O. lurida* for which males are not associated]

1. Forewing with 1 or more patches of scales (androconia) on lamina (figs 1, 6) 2
 - Forewing without scales on lamina (figs 38, 39) 17
2. Inferior appendages in ventral view with length less than twice width at base (figs 13, 31) 3
 - Inferior appendages in ventral view with length about twice width at base, or longer (figs 3, 7, 17), 4
3. Inferior appendages in ventral view more or less quadrate; phallus in lateral view with paramere about 2–3 times length of abdominal segment VIII, strongly arched dorsally (figs 31, 32) *O. jenniae*
 - Inferior appendages in ventral view more or less quadrate; phallus about 3–4 times length of abdominal segment VIII, almost straight (figs 13, 15) *suteri*
4. Inferior appendages in ventral view abruptly angled meso-dorsally at about two-thirds length, rather than smoothly curved, apices truncate (fig. 25) *O. geniculata*
 - Inferior appendages not as above 5
5. Pre-anal appendages with length about 3 times width (figs 52, 53) *O. ada*
 - Pre-anal appendages with length less than 3 times width (figs 34, 36, 44, 45) 6
6. Inferior appendages in ventral view with a triangular meso-basal lobe dorsally (figs 33, 35) 7
 - Inferior appendages without a lobe as above 8
7. Inferior appendages in ventral view with the triangular meso-basal dorsal lobe prominent and proximal to a sharply triangular apico-mesial angle (fig. 35) *O. theischingeri*
 - Inferior appendages in ventral view with the triangular meso-basal dorsal lobe less prominent and without a sharply triangular apico-mesial angle (fig. 33) *O. mouldsi*
8. Inferior appendages in ventral view with length more than 3 times basal width; phallus short, about length of 1 abdominal segment, sclerotised paramere slender (figs 43, 45) *O. buitenzorgensis*
 - Not as above 9
9. Inferior appendages in ventral view fused mesially in basal third; in lateral view with length about 4 times width (figs 49, 50) *O. searica*
 - Not as above 10
10. Inferior appendages in ventral view stout, mesial margin excavated in distal half; phallus greater than 4 times length of abdominal segment VIII (fig. 3) *O. pechana*
 - Not as above 11
11. Inferior appendages in ventral view stout at base, gradually excavated towards apex, slender distally; phallus in lateral view with sclerotised paramere arched ventrally (figs 22–24) *O. kateae*
 - Not as above 12
12. Inferior appendages in ventral view stout throughout length, mesially gradually excavated from base, apices rounded (figs 7, 54) 13
 - Not as above 15
13. Phallus with sclerotised paramere equal to about 2–3 times length of abdominal segment VIII 14
 - Phallus without sclerotised paramere (fig. 54) *O. gilva* (part)
14. Inferior appendages in ventral view dilated lateral at about half length, somewhat sinuous in appearance (fig. 7) *O. walpolica*
 - Inferior appendages in ventral view swollen basally, gradually tapered towards apices (Neboiss, 1977: fig. 771) *O. umbra*
15. Inferior appendages in ventral view stout basally, sharply excavated on mesial margin at about two-thirds length, apices rounded; sclerotised paramere of phallus about length of 2 abdominal segments (figs 9, 10) *O. magelensis*
 - Not as above 16
16. Inferior appendages about equal width throughout length, sinuous in lateral view, apices rounded to truncate (figs 16, 17) *O. radonensis*
 - Inferior appendages about equal width for most of length, distally tapered to acute convergent apices (figs 19, 20) *O. humphreyi*
17. Forewing with distinctly spotty pattern; inferior appendages close-pressed meso-ventrally for proximal half, mesial margin excavated in distal half; phallus about length of 2 abdominal segments, with sclerotised paramere strongly arched dorsally, down-turned in distal section, apically acute (figs 27, 28) *O. litua*
 - Forewing without distinctly spotty pattern, although usually with crossveins and vein forks and anastomoses marked by dark membrane and hair; inferior appendages not close-pressed for more than one-fifth length; phallus usually shorter than length of 2 abdominal segments, sclerotised paramere strongly reduced, absent or very slender 18
18. Inferior appendages with length longer than basal width (fig. 54) *O. gilva* (part)
 - Inferior appendages with basal width greater than length (figs 37, 40, 46) 19
19. Inferior appendages in ventral view with apico-mesial angles acute; phallus with sclerotised paramere finely whip-like distally; a pair of membranous lobes flanking abdominal segment X (fig. 37) *O. australis*
 - Not as above 20
20. Abdominal segment X in lateral view with an apically acute ventral process at about half length; inferior appendages in lateral view tapered toward apex (figs 40, 42); antennal segment with brush of long setae on leading edges *O. quadrula*
 - Abdominal segment X in lateral view expanded towards apex, lacking a ventral process; inferior appendages in lateral view rod-shaped (fig. 48); each antennal segment with setae all about equal length *O. burtoni*

Oecetis pechana Mosely

Figures 1–6, 56

Oecetis pechana Mosely in Mosely and Kimmins, 1953: 302, figs 213–215. —Neboiss, 1977: 143, figs 764–769. —Neboiss, 1986: 267.

Material examined. Holotype. Male, Yanchep, WA, 31°32.9'S, 115°41.2'E (BMNH).

Other material: Some 240 samples from all states of Australia were examined, in collections of NMV, ANIC, QM, NTM.

Diagnosis. Male. Recognised by a combination of wing features, including scale patches, and the general form of the genitalia with inferior appendages in ventral view stoutly clasper-shaped, smoothly curved mesially, and broadly rounded apically; abdominal segment X a simple membranous plate; the phallus long and straight, extending the length of 3–4 abdominal segments, and having the paramere stout and darkly sclerotised. Male forewing (fig. 1) length 5.5–9.6 mm.

Males of closely similar species differ from *O. pechana* as follows: *O. walpolica* has the inferior appendages in lateral view tapered to narrowly rounded apex, phallus shorter, its length equalling about 2 abdominal segments, and the paramere strongly arched dorsally; *O. kateae* has inferior appendages in lateral view even more narrowly tapered and curved upwards, phallus shorter, paramere arched ventrally; *O. magelensis* has the inferior appendages shallowly excavated mesially, phallus shorter, about 2–3 abdominal segments in length; *O. gilva* usually has no scales on the forewing, inferior appendages in lateral view attenuate apically, and phallus very short, about length of 1.5 abdominal segments, without paramere.

Distribution. Australia-wide.

Remarks. As defined here, *O. pechana* is difficult to distinguish from closely similar species, since the key diagnostic feature is the length of the male phallus. This feature is surely biologically significant, acting as a reproductive isolating mechanism, determining mating success. Nevertheless, it does appear likely that hybridisation between *O. pechana* and other species occurs, and this may be confirmed if molecular studies are carried out in the future. *Oecetis suteri* similarly has the phallus elongate, but can easily be distinguished by the much reduced inferior appendages. *Oecetis pechana* is often common in both lentic and lotic systems, where its larvae build tube cases of sand.

Oecetis walpolica Neboiss

Figures 7, 8, 57

Oecetis walpolica Neboiss, 1982: 321, figs 123–125. —Neboiss, 1986: 267.

Holotype. Male, Frankland R., Circular pool, 6 km NE of Walpole, WA (NMV: T-6596).

Material examined. Forty-five samples, most from WA, several from NT.

Diagnosis. Male. Closely resembling *O. pechana*, especially in form of the wings, shape of inferior appendages in ventral view, and presence of the basi-dorsal pouch on the inferior appendages. Distinguished from that species by the male genitalia with inferior appendages attenuate apically in lateral view, and phallus about

half length of that of *O. pechana* and strongly arched dorsally. Also resembling *O. kateae* sp. nov. in general form, but the phallus of *kateae* is less strongly curved and arches ventrally, and the inferior appendages in ventral view are more widely curved and attenuate apically. Male forewing length 5.7–10 mm.

Distribution. Distributed from south-western WA inland and northwards to the far north of NT.

Remarks. *Oecetis walpolica* is easily mistaken for *O. pechana* and, similarly, is found in waterholes of the arid inland.

Oecetis umbra Neboiss

Figure 58

Oecetis umbra Neboiss, 1977: 144, figs 770–773. —Neboiss, 1986: 268.

Holotype. Male, Tas., Waldheim, Cradle Mountain National Park (NMV T-5489).

Material examined. Tas.: 1 male, Lake Dobson, 20 Feb 1967, E.F. Riek (ANIC); numerous males, females, Franklin R., Roaring Creek junction, 1 km above Gordon R., 8 Jan 1977, Coleman, Neboiss, Allbrook (NMV); 1 male, Gordon R., 1 km above First Split, 11 Jan 1977, Coleman, Neboiss, Allbrook, Swain (NMV); 2 males, 1 female, swamp near Olga R., 19 km above Gordon R. Junction, 13 Jan 1977, Neboiss and Swain (NMV); 2 males, 2 females, Caves Camp, NE of New R. Lagoon, 2 Jan 1979, S.F. McEvey (NMV); numerous males, females, south coast, Cavers Camp, New R. Lagoon, 3 Jan 1979, S.F. McEvey (NMV).

Diagnosis. Male. Closely resembling *O. pechana* and *O. walpolica* in general features such as scales on the wing and clasper-shaped inferior appendages, but distinguished from both these species by shorter phallus with the paramere only slightly curved, and inferior appendages divergent apically, rather than convergent.

Distribution. Known only from Tas.

Remarks. Neboiss, 1977 compared this species to the New Zealand *Oecetis unicolor* McLachlan and Chatham I. *O. chathamensis* Tillyard and it certainly resembles those species more closely than it does Australian species.

Oecetis magelensis sp. nov.

Figures 9–11, 59

Material examined. Holotype. Male, NT, Alligator R. region, Magela Creek, OSS Site 009, 12°42'S, 132°57'E, 17 Jan 1992, Wells (ANIC).

Paratypes. NT: 24 males, ARR, Magela Creek site 009, 15 Feb 1991, Wells (ANIC); 5 males, 5 females, ARR, Magela Creek at Rum pipeline, 18–19 Feb 1991, P. Dostine (NMV).

Other material. NT: 1 male, Mataranka HS, Roper R., 25 Jan 1977, M.S. and B.J. Moulds (NMV); 1 male, 1 female, 12°42'S, 132°57'E, Kakadu National Park, Magela Creek, OSS Site 009, 28–29 Jan 1991, P. Dostine (NTM); 2 males, 12°42'S, 132°57'E, Kakadu National Park, Magela Creek, OSS Site 009, 15 Feb 1991, Wells (NTM); 3 males, ARR, Magela Creek at Rum pipeline, 1–2 Apr 1991, P. Dostine (NMV); 3 males, 12°42'S, 132°57'E, Kakadu National Park, Magela Creek, OSS Site 009, 1–2 Apr 1991, P. Dostine (NMV); 3 males, 1 female, Jabiru Town Lake, 12°40'S, 132°53'E, 5 Apr 1991, Wells and Webber (NTM); 6 males, 12°42'S, 132°57'E, Kakadu National Park, Magela Creek, OSS

Site 009, 24 Apr 1991, Wells and Webber (NTM); 1 male, 1 female, 12°42'S, 132°57'E, Alligator R. Region, Magela Creek, OSS Site 009, 28–29 Apr 1991, P. Dostine (NTM); 1 male, 1 female, Gregory National Park, Limestone Gorge, 25–26 Oct 1991, J. Webber (NTM); 1 male, 1 female, 12°42'S, 132°57'E, Kakadu National Park, Magela Creek, OSS Site 009, 3–4 Feb 1992, P. Dostine (NTM); 1 male, 12°42'S, 132°57'E, Kakadu National Park, Magela Creek, OSS Site 009, 21–22 Mar 1992, P. Dostine (NTM). WA: 2 males, 2 females, Maggie Creek, 3 Feb 1978, J.E. Bishop (NMV); 3 males, Maggie Creek, 90 km Kununurra-Wyndham, 3 Feb 1978, J.E. Bishop (NMV); 1 male, stream opposite Dead Horse Gap, Lake Argyle, 19 Feb 1977, J.E. Bishop (NMV); 1 male, 4 females, Lily Creek Waterhole, 15 km W of Kununurra, 22 Feb 1977, J.E. Bishop (NMV); 1 male, 1 female, Dunham R. W of Kununurra, J.E. Bishop, 22 Feb 1977 (NMV); 1 male, Ord R. at Kununurra Dam, 22 Feb 1977, J.E. Bishop (NMV).

Diagnosis. Males resemble *O. pechana* and *O. walpolica*, the male genitalia appearing closely similar in ventral view, but are distinguished from the former by the shorter phallus with a strongly arched paramere, and from both *O. pechana* and *O. walpolica* by features of the inferior appendages: in ventral view, the mesial margin is lined proximally with a row of small setae, then excavated to form a small concavity; apically a cluster of short setae; in lateral view the narrower distal section of the inferior appendages is shorter and more closely resembles that of *O. suteri* sp. nov.

Description. Male. Forewing slender, length 5.0–9.0 mm, with short hair on veins, dark spots at vein junctions formed by pigmented membrane and darker vestiture; and a single broad patch of scales. Abdominal segments II–IV with tergites darkly sclerotised, IX short, pale, slightly produced mid-dorsally, X a simple, membranous plate, triangular distally. Genitalia (figs 9–11). Pre-anal lobes length about 1.5 times width, apically rounded. Phallus membranous, length equal to 2–3 abdominal segments, apico-ventral portion of phallosome sharply beak-like and down-turned, paramere darkly sclerotised, in lateral view strongly arched dorsally. Inferior appendages stout throughout length in ventral view, apically rounded, mesial margin lined proximally with short setae, abruptly excavated at about two-thirds length, with a pouch meso-dorsally on basal section; in lateral view stout, with a short, rounded lobe dorsally.

Distribution. Found in the north of WA and the NT.

Remarks. *Oecetis magelensis* is difficult to distinguish from *O. walpolica*, but has the inferior appendages in lateral view with distal narrower section shorter and in ventral view tending to converge, whereas in *O. walpolica* the inferior appendages tend to turn outward toward apices.

Oecetis suteri sp. nov.

Figures 12–15, 60

Material examined. Holotype. Male, Holmes Jungle NT, 7 Jun 1991, Horak and Wells (ANIC, on slide).

Paratypes. NT: 2 males, Kakadu National Park, Baroalpa Springs, 25 Apr 1991, Wells and Webber (ANIC); 2 males, 12°42'S, 132°57'E, Kakadu National Park, Magela Creek, OSS Site 009, 28–29 Jan 1992, P. Dostine (NTM); 2 males, same locality, 3–4 Feb 1992, P. Dostine (NTM); 2 males, Litchfield National Park, Walker Creek, 18–19 Apr 1992, Wells (NMV).

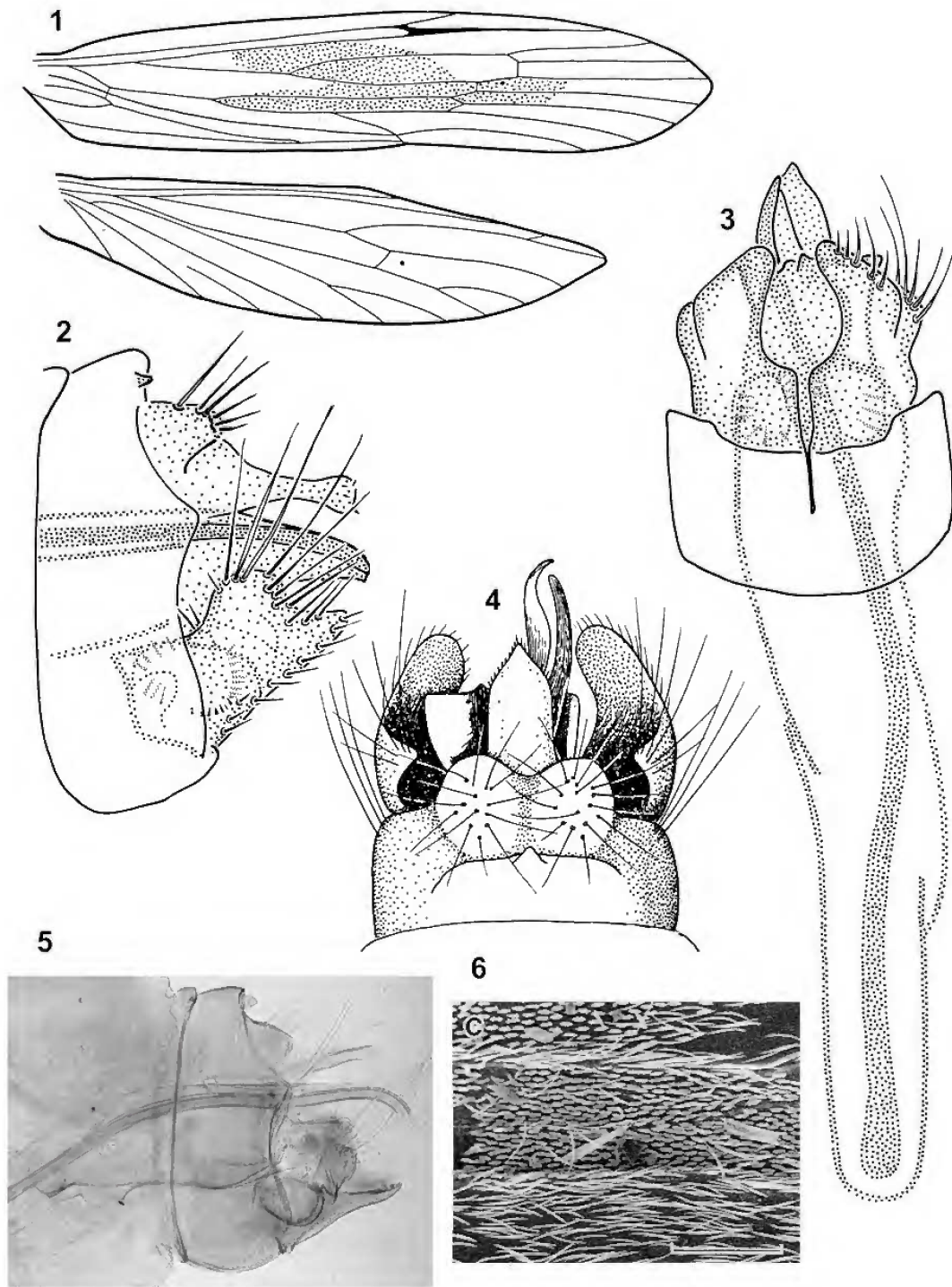
Other material. NT: 2 males, 12°52'S, 132°50'E, Koongarra, 15 km E of Mt Cahill, 15 Nov 1972, J.C. Cardale (ANIC); numerous males, females, 16°40'S, 135°51'E, Bessie Spring, 8 km ESE of Cape Crawford, 25 Oct 1975, J.C. Cardale (ANIC); 1 male, 1 female, 16°40'S, 135°51'E, 8 km ESE of Cape Crawford, 26 Oct 1975, J.C. Cardale (ANIC); 2 males, 1 female, 16°32'S, 136°10'E, Cattle Creek, 54 km S by W of Borroloolua, 27 Oct 1975, J.C. Cardale (ANIC); 1 male, 1 female, SAR, 14 Jun 1988, P. Dostine, Site 1 (NTM); 1 male (headless), ARRS, Radon Springs, 13–14 Apr 1989, Suter and Wells (NMV); 2 males, Kakadu National Park, Baroalpa Springs, 25 Apr 1991, Wells, Webber and Bickel (NTM); 3 males, 2 females, Berry Springs, 30 Oct 1991, Wells and Webber (NTM); 2 males, 12°42'S, 132°57'E, Kakadu National Park, Magela Creek, OSS Site 009, 28–29 Jan 1992, P. Dostine (NTM); 2 males, same locality and collector, 3–4 Feb 1992 (NTM); 2 males, Litchfield National Park, Walker Creek, 18–19 Apr 1992, Wells (NTM). Qld: 1 male, Lockerbie Scrub, Cape York Peninsula, 15 Apr 1975, M.S. Moulds (NMV); 1 male, Cape York Peninsula, upper Jardine R., 11°17'S, 142°35'E, 13 Oct 1979, M.S. and B.J. Moulds (NMV); 2 males, same locality and collectors, 17 Oct 1979 (NMV); 14 males, 6 females, Bertie Creek, 1 km SE Heathlands HS, 4 Feb 1992, D. Cartwright and A. Wells (ANIC); 2 males, 1 female, tributary of Bertie Creek, 250 m SW Heathlands HS, 4 Feb 1992, D. Cartwright and A. Wells (NMV); 1 male, Eliot Creek upstream junction Canal Creek, 6 Feb 1992, D. Cartwright and A. Wells (NTM); 4 males, 7 females, Dulhunty R., at Telegraph Crossing, 10 Feb 1992, D. Cartwright and A. Wells (NMV); 17 males, 7 females, tributary of Bertie Creek, 250 m SW Heathlands HS, 11 Feb 1992, D. Cartwright and A. Wells (ANIC, 2 males on slides); 5 males, 3 females, Gunshot Creek at Telegraph Crossing, 14–15 Feb 1992, D. Cartwright and A. Wells (QM); 1 male, 1 female, same locality and collectors, 17 Feb 1992 (QM); numerous males, females, Gunshot Creek at Telegraph Crossing, 4–5 Apr 1992, M. Crossland (ANIC). WA: 1 male, 1 female, Millstream Crossing Pool, 2 Oct 1970, J.C. Cardale (ANIC); 4 males, Drysdale R., upper reaches, 16°09'S, 125°58'E, 7 Sep 1996, I. Edwards (NMV).

Diagnosis. Alone in the *pechana*-group, *O. suteri* lacks fork 1 in the posterior wing; the forewing is more rounded apically than most species in this group and the scale patches narrower. Otherwise it resembles *O. pechana* and *O. magelensis* superficially, but in the male is distinguished from both by the inferior appendages broader than long in ventral view. Like *O. pechana*, *O. suteri* has the phallus about the length of 4 abdominal segments.

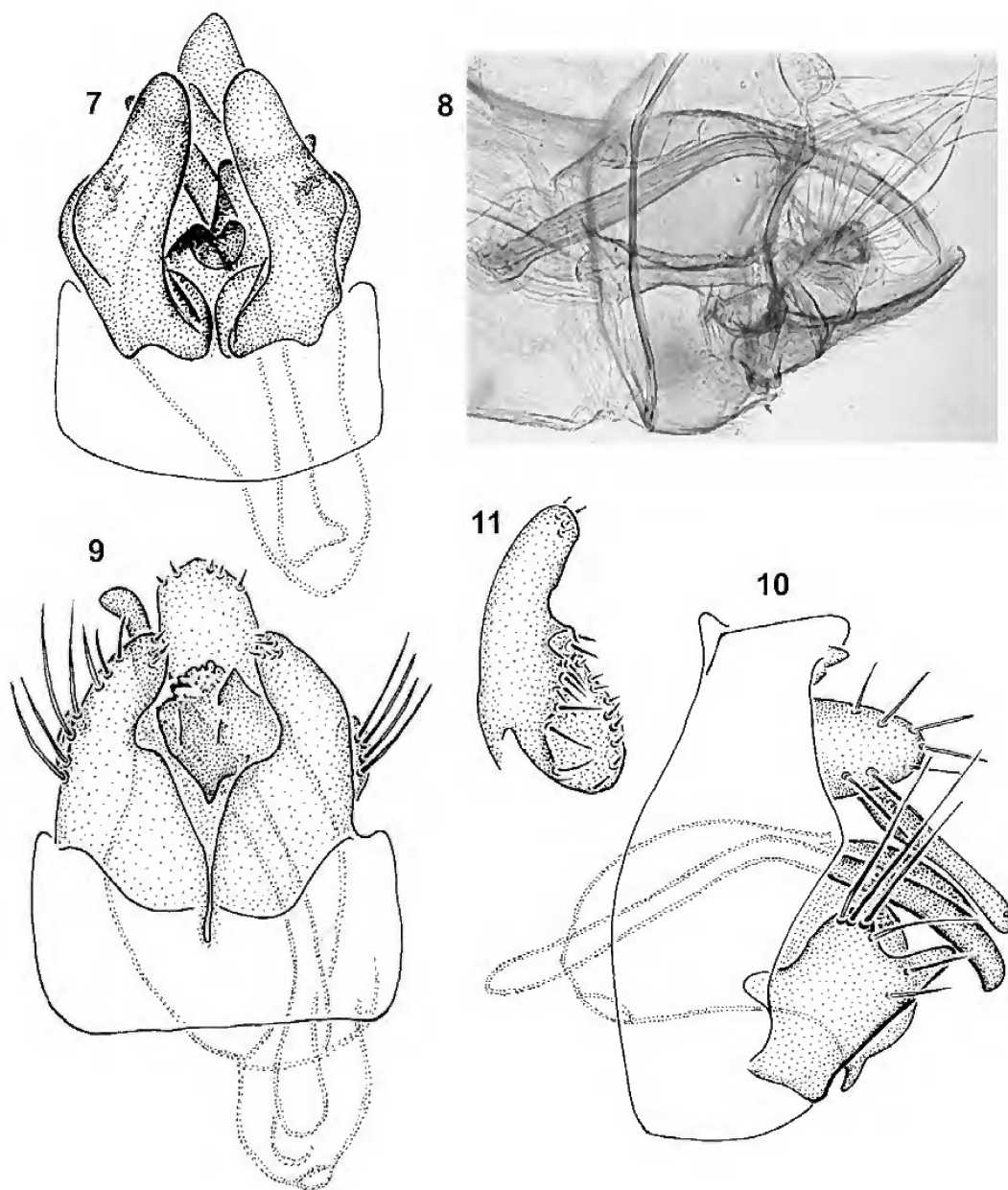
Description. Male. Wings narrower than in *O. pechana*, with dark markings at crossveins, anastomoses and at marginal ends of veins; vestiture short; forewing with a narrow, elongate patch of scales, discoidal and thyridial cells long, narrow, discoidal cell extending distally beyond M-R, M-R distal to thyridial cell; hind wing without fork 1. Forewing length, 4.3–4.6 mm. Abdominal tergites II–IV darkly sclerotised. Genitalia, see figs 12–15. Abdominal segment IX of moderate length, dorsally with paired papillae apico-mesially. Abdominal segment X sub-triangular, short setae scattered apically. Inferior appendages broad basally, slightly extended laterally, in lateral view triangular; a rounded dorsal pouch present. Phallus elongate, about 4 times length of abdominal segment IX, with a long, almost straight paramere.

Distribution. Collected in WA from the Millstream and Kimberley regions, in NT from the north, and in Qld, from the tip of Cape York.

Etymology. Named for Phillip Suter.

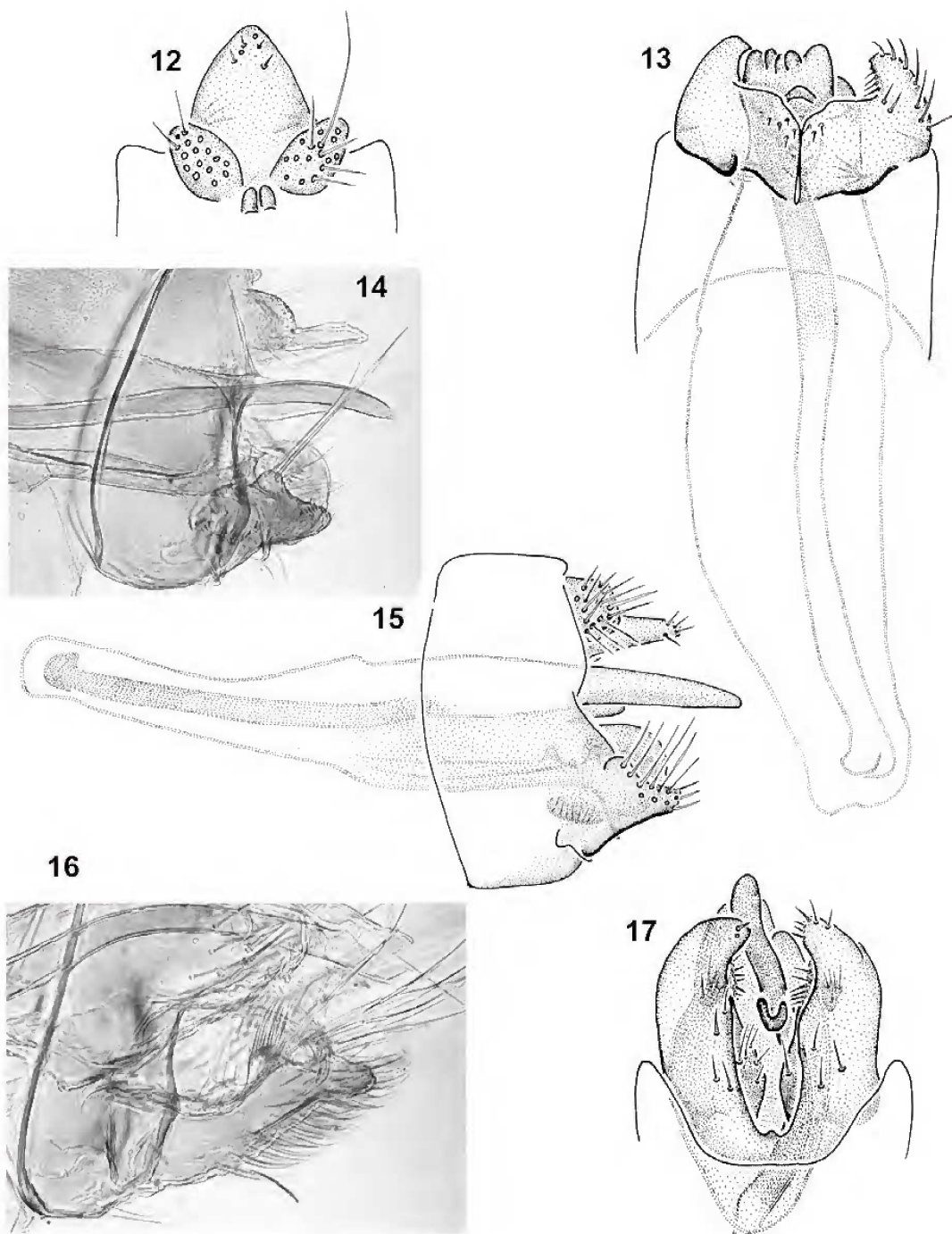


Figures 1–6, *Oecetis pechana* Mosely, male: 1, forewings and hind wings; 2–5, genitalia in lateral, ventral, dorsal and lateral views, respectively (4, after Mosely and Kimmins, 1953; 5, image taken from slide preparation); 6, wing scales (after CSIRO 1991).



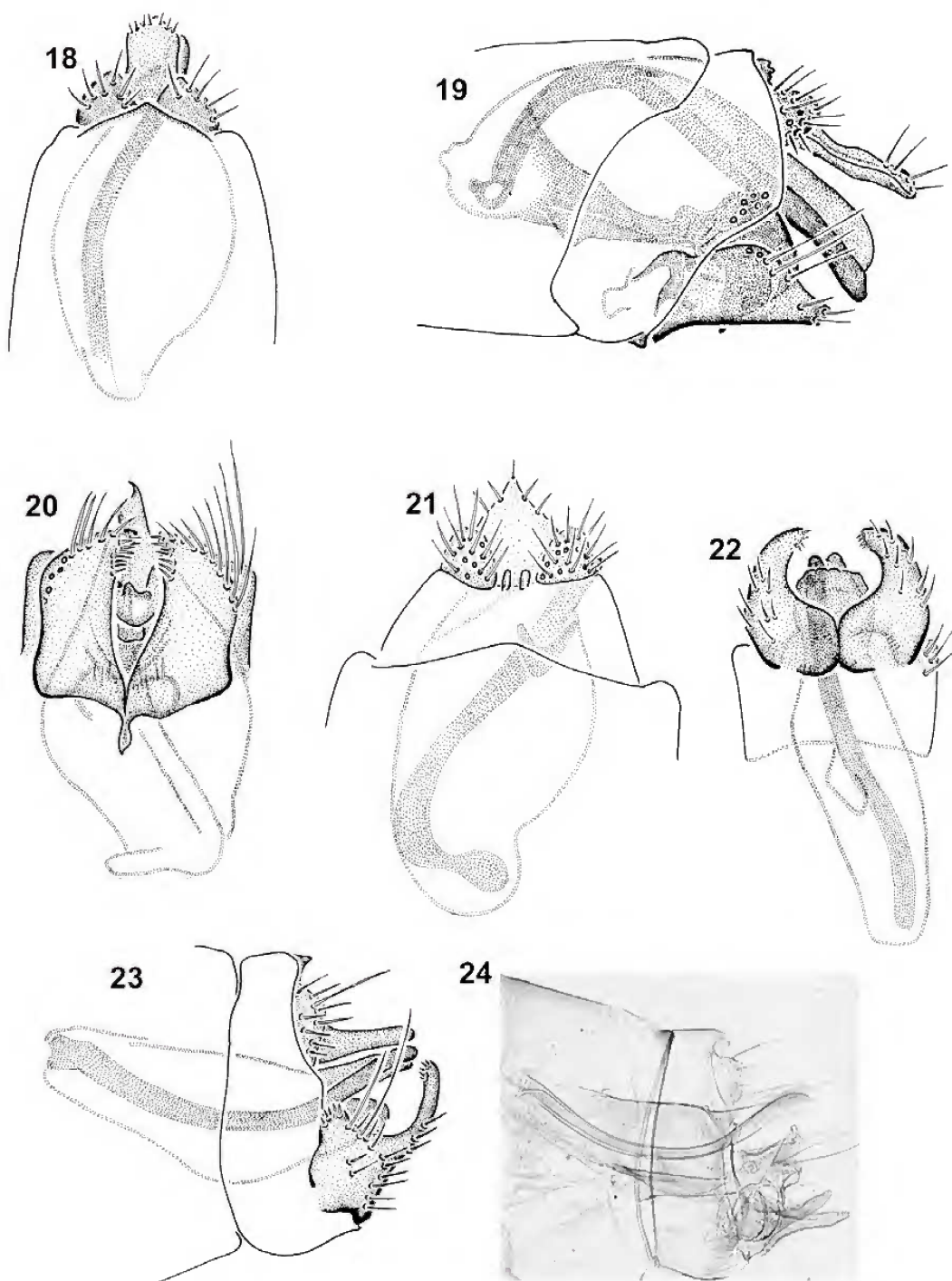
Figures 7, 8, *Oecetis walpolica* Neboiss, male genitalia in ventral and lateral views (8, image taken from slide preparation).

Figures 9–11, *Oecetis magelensis* sp. nov., male genitalia: 9, 10, ventral view and lateral view; 11, dorsal view of right inferior appendage.



Figures 12–15, *Oecetis suteri* sp. nov., male genitalia: 12, dorsal view; 13, ventral view, 14, 15 lateral views (14, image taken from slide preparation).

Figures 16, 17, *Oecetis radonensis* sp. nov., male genitalia in lateral and ventral views (16, image taken from slide preparation).



Figures 18–20, *Oecetis humphreyi* sp. nov., male genitalia in dorsal, lateral and ventral views.

Figures 21–24, *Oecetis kateae* sp. nov, male genitalia in dorsal, ventral and lateral views (24, image taken from slide preparation).

Oecetis radonensis sp. nov.

Figures 16, 17, 61

Material examined. Holotype. Male, NT, Kakadu National Park, Radon Springs, Suter and Wells, 13–14 Apr 1989 (NMV T-18840).

Paratypes. NT: 17 males, 14 females, same data as for holotype (NMV and NTM: 1 male on slide); 4 males, 3 females, Little Baroalba Creek, 25–26 Apr 1991, Wells and Webber (ANIC); 1 male, Kakadu National Park, Baroalba Springs, 12°48'S, 132°49'E, 4 Mar 1992, Wells (NTM).

Other material. NT: 1 male, Radon Creek, Kakadu National Park, 3 Sep 1979, J. Blyth (NMV). WA: 1 male, Mitchell Plateau, 30 Jan 1978, J.E. Bishop (NMV).

Diagnosis. Closely similar to *O. humphreyi* sp. nov. but male distinguished by having inferior appendages in ventral view, stout throughout length, rounded apically, and with 2 small patches of setae at about two-thirds length; phallus longer with paramere only very slightly curved.

Description. Male. Wings narrow, dark markings at crossveins, anastomoses and at marginal ends of veins; vestiture short; with a single elongate patch of scales; forewing length 4.8–5.5 mm. Abdominal segments III and IV with tergites sclerotised; segment IX excavated mid-ventrally and thus appearing to have well-developed lateral lobes; X spatulate in dorsal view, slender and elongate in lateral view. Genitalia, see figs 16, 17. Pre-anal appendages sub-triangular. Phallus about 1.5 segments long; phallosome with membranous apex sharply down-turned; paramere in lateral view slightly curved. Inferior appendages elongate and in ventral and lateral views almost uniformly stout throughout length; in ventral view with apices in-turned, without a basi-dorsal pouch; dorsally at about two-thirds length a small group of short setae on a raised papilla, another cluster on mesial margin, these possibly homologous with the sets of setae on papillae in the basi-dorsal pouches seen in *O. pechana* and other species.

Distribution. From the Kimberley region of northern WA and the north of the NT, but not a commonly collected species.

Etymology. Named for the type locality, on the edge of Mt Brockman in Kakadu National Park.

Oecetis humphreyi sp. nov.

Figures 18–20, 62

Material examined. Holotype. Male, NT, Radon Springs, 13–14 Apr 1989, Suter and Wells (NMV T-18841).

Paratypes. NT: 2 males, same data as for holotype (NMV); 1 male, 12°48'S, 132°49'E, Kakadu National Park, Baroalba Springs, 25 Apr 1991, Wells and Webber (NTM); 4 males, females, same locality and collectors, 29 May 1991 (NTM); 2 males, same locality and collectors, 4 Oct 1991 (NTM); 1 male, Berry Springs, edge of *Melaleuca* nr Billabong, 8–9 Apr 1991, Wells and Horak (NTM); 1 male, Berry Springs, 4 Oct 1991, Wells (NTM).

Other material. NT: 3 males, 1 female, Butterfly Gorge, Katherine Gorge National Park, 27 Jan 1977, M.S. Moulds (NMV); numerous males, females, ARR Magela Creek OSS site 009, 15 Feb 1991, A. Wells (NMV); 2 males, ARR Magela Creek 009, 15 Mar 1991, Wells and Webber (NTM); numerous males, females, 12°40'S, 132°53'E, Jabiru, Town Lake, 2 Apr 1991, Wells and Webber (NTM); 1

male, 12°42'S, 132°57'E, Kakadu National Park, Magela Creek, at Rum Pipeline, 6–7 May 1991, P. Dostine (NMV); 1 male, 1 female, Gregory National Park, Limestone Gorge, 25–26 Oct 1991, J. Webber (NTM); 1 male, 12°42'S, 132°57'E, Kakadu National Park, Magela Creek, OSS Site 009, 14 Apr 1992, Wells and Webber (NTM); 1 male, same locality, 21–22 Apr 1992, P. Dostine (NTM). WA: 1 male, 1 female, Dead Horse Springs, Lake Argyle, 19 Feb 1977, J.E. Bishop (NMV); 1 male, Fine Springs Creek, on road between Lake Argyle tourist village and Duncan Highway, 23 Feb 1977, J.E. Bishop (NMV).

Diagnosis. Closely similar to *Oecetis radonensis*, but male with inferior appendages distally more strongly tapered to sharper apices, a row of setae on the inner margin sub-apically; abdominal segment X triangular; and phallus of medium length with paramere, in lateral view, strongly arched dorsally.

Description. Male. Wings with vestiture short; forewing with a broad scale patch. Anterior wing length, 4.6–4.7 mm. Abdominal tergites II–IV darkly sclerotised; segment IX strongly excavated ventrally, with a pair of small apico-dorsal papillae; segment X broad-based, triangular in dorsal view, elongate and slender in lateral view. Genitalia, see figs 18–20. Pre-anal appendages well separated, in dorsal view, triangular. Phallus of moderate length, apically beak-like in lateral view; paramere strongly twisted at base in ventral view, in lateral view strongly arched dorsally. Inferior appendages in lateral view tapered towards apex, in ventral view stout with apices convergent, short setae on inner subapical margin, basi-dorsal pouch small and rounded.

Distribution. Collected from the north of the NT and the Kimberley Region of northern WA.

Etymology. Named for Chris Humphrey.

Oecetis kateae sp. nov.

Figures 21–24, 63

Material examined. Holotype. Male, NT, 12°40'S, 132°53'E, Jabiru, Town Lake, 16 Feb 1991, Wells (ANIC).

Paratypes. NT: 2 males, 14 females, same data as for holotype (NTM, ANIC); 22 males, 38 females, 12°42'S, 130°58'E, Berry Springs, 9 Apr 1991, A. Wells and M. Horak (NTM, NMV); 14 males, 23 females, 13°03'S, 130°47'E, Litchfield National Park, Florence Falls, 6 Jun 1991, Wells and Webber (ANIC).

Other material. Ninety-seven samples from NT, Qld, NW WA and NE NSW.

Diagnosis. Recognised by inferior appendages more slender and smoothly curved than those of *O. pechana* and *O. walpolica*, and by the ventrally arched paramere of the phallus.

Description. Male. Wings with short hair, darkly pigmented hair and membrane at anastomoses of veins and crossveins; forewing with a single large patch of scales. Forewing length, 5.1–5.9 mm. Abdominal tergites II–IV darkly sclerotised, segment IX narrow, almost a regular annulus, dorsally slightly pointed apico-mesially, segment X narrow, tapered towards apex. Genitalia, see figs 21–24. Pre-anal appendages short, wider than long. Inferior appendages stouter basally than distally but almost C-shaped in ventral view, in lateral view broad-based, slender, upturned distally, basi-dorsal pouch present. Phallus about length of 3 abdominal segments, membranous ventral phallosome small, not down-turned, paramere arched ventrally.

Distribution. A widely distributed species that is often abundant in light trap samples from the Kimberley of WA, through the north of the NT to northern Qld, and south east to the border of Qld and NSW.

Remarks. Superficially males of this species resemble those of *O. walpolica* save that the inferior appendages are distally more slender, but close examination of the male genitalia confirms the unique state of the paramere of the phallus, arching in the opposite direction from that of *O. walpolica*, and far less strongly curved.

Etymology. Named for Kate Humphrey.

***Oecetis geniculata* sp. nov.**

Figures 25, 26, 64

Material examined. Holotype. Male, NT, Litchfield National Park, Billabong, 18–19 Apr 1992, A. Wells (ANIC).

Paratypes. NT: 21 males, 33 females, same data as for holotype (NTM and ANIC); 17 males, 15 females, Humpty Doo, Solar Village, 9 Apr 1991, Horak and Upton (NMV).

Other material. Forty-five samples from the north of NT.

Diagnosis. Readily distinguished by the almost jointed appearance of the inferior appendages in ventral view, the unusually slender wings, and markings on the forewings.

Description. Male. Wings with vestiture short; forewing with a patch of scales, but scales appear to be readily dehiscent so that often specimens are collected without scales. Forewing length 4.6–5.0 mm. Abdominal segments II–IV darkly sclerotised, segment IX of moderate length, segment X sub-triangular. Genitalia, see figs 25–26. Pre-anal appendages almond-shaped. Inferior appendages stout, elongate, ridged and turned inward at about two-thirds length, giving a jointed appearance; without a basi-dorsal pouch. Phallus about 1.5 abdominal segments long, paramere straight.

Distribution. Often abundant in samples from the north-west of NT.

Etymology. The name derives from the Latin *geniculatus* — knotty, for the somewhat jointed appearance of the inferior appendages.

Remarks. This species is small and pale, its narrow wings lacking the usual dark markings of the *pechana*-group. It is commonly collected at billabongs or other stillwater bodies.

***Oecetis litua* sp. nov.**

Figures 27–29, 65

Material examined. Holotype. Male, 12°40'S, 132°53'E, Jabiru, Town Lake, 30 May 1991, Wells and Webber (ANIC).

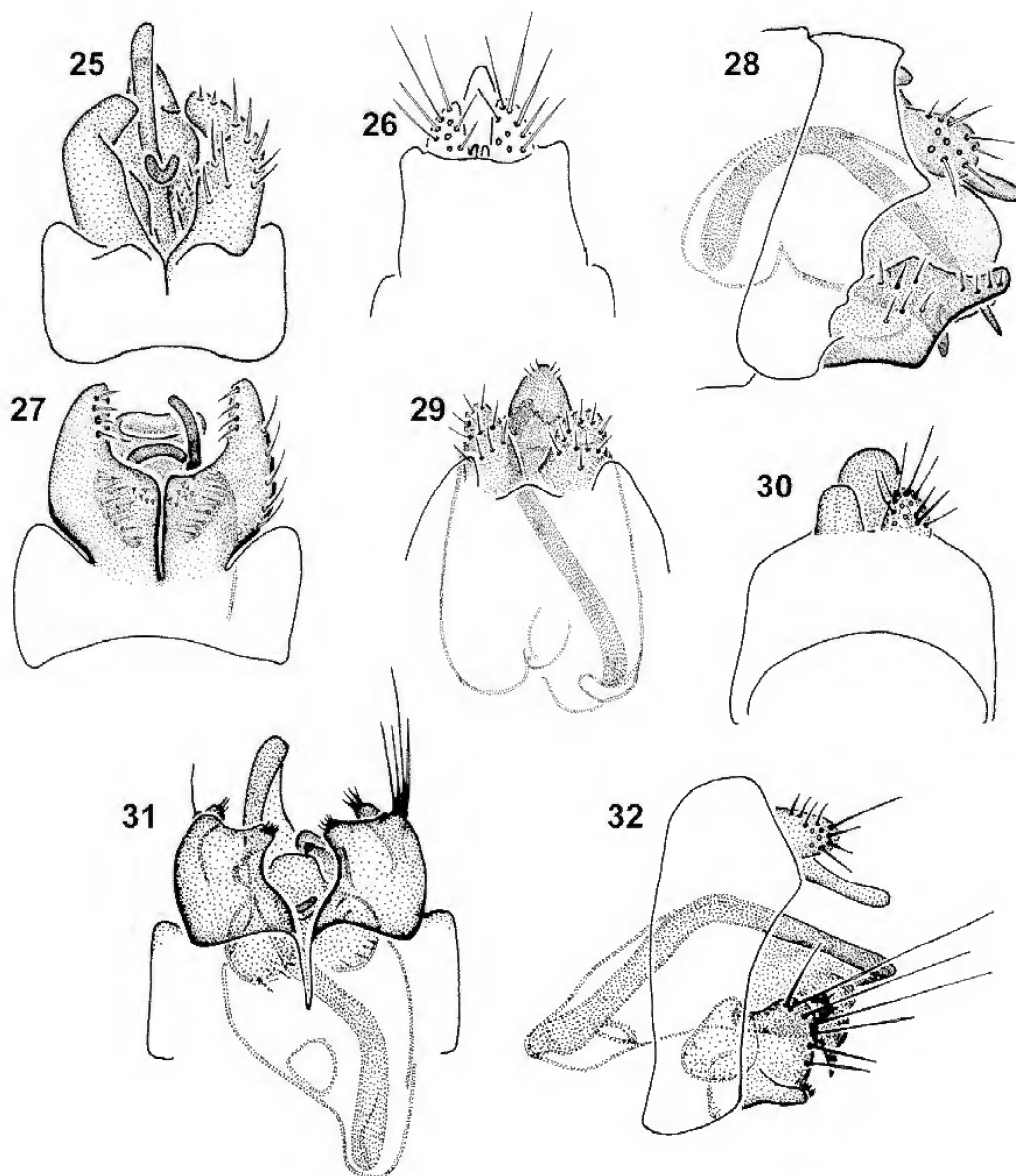
Paratypes. NT: 46 males, 9 females, East Alligator R. at Cahill's Crossing, Wells and Suter, 27 May 1988 (NMV).

Other material. NT: 2 males, 12°17'S, 133°20'E, Cooper Creek, 11 km SW of Nimbawah Rock, 3–4 Jun 1973, J.C. Cardale (ANIC); 3 male, 3 females, 12°06'S, 133°04'E, Cooper Creek, 19 km SE of Mt Borroilaie, 5–6 Jun 1973, J.C. Cardale (ANIC); 1 male, 12°25'S, 132°58'E, 1 km of Cahills Crossing (East Alligator R.), 7–8 Jun 1973, J.C. Cardale (ANIC); 3 males, 12°52'S, 132°50'E, Koongarra,

15 km E of Mt Cahill, 12–13 Jun 1973, J.C. Cardale (ANIC); 1 male, 12°52'S, 132°47'E, Nourlangie Creek, 8 km E of Mt Cahill, 14–15 Jun 1973, J.C. Cardale (ANIC); 2 males, 12°57'S, 132°33'E, Jim Jim Creek, 19 km WSW of Mt Cahill, 17 Jun 1973, J.C. Cardale (ANIC); 1 male, 1 female, 15°58'S, 136°21'E, 12 km NNE of Borrooloola, 1 Nov 1973, J.C. Cardale (ANIC); numerous males, females, Katherine R. Gorge Nat. Pk, 13 Aug 1979, J. Blyth (NMV); numerous males, females, Adelaide R., 15 km E of Stuart Highway, 15 Aug 1979, J. Blyth (NMV); 5 males, 1 female, South Alligator R., UDP Falls [Gunlom], 7 Sep 1979, J. Blyth (NMV); 5 males, junction of Arnhem Highway and Oenpelli Rd, 26–27 Jun, 1980, M.B. Malipatil (NMV); 2 males, UDP Falls [Gunlom], 18–19 Jul 1980, M.B. Malipatil (NMV); 2 males, ARRS, South Alligator R. at Gimbat OSS Station, 28 Apr 1988, P. Dostine (NMV); 1 male, Magela Creek, Stoned Billabong, 15 May 1988, Wells and Suter (NMV); 2 males 3 females, ARRS, Radon Springs, 18 May 1988, A. Wells and P. Suter (NMV); 3 males, Coonjimba Billabong, 19 May 1988, P. Suter and A. Wells (NMV); 1 male, Magela Creek at Ranger pipe outlet, 20 May 1988, A. Wells and P. Suter (NMV); 1 male, ARRS, Ranger Mine RP1, 20 May 1988, A. Wells and P. Suter (NMV); 2 males, Magela Creek at Ranger pipe outlet, 23 May 1988, A. Wells and P. Suter (NMV); 1 male, 1 female, ARRS, South Alligator R. below Fisher Creek junction, 24 May 1988, A. Wells and P. Suter (NMV); 2 males, ARRS, South Alligator R. at Gimbat OSS Station, 24 May 1988, A. Wells and P. Suter (NMV); 2 males, South Alligator R. below BHP camp, 25 May 1988, P. Suter and A. Wells (NMV); 1 male, 1 female, South Alligator R., 14 Jun 1988, P. Dostine, site 1 (NMV); 2 males, 12°36'S, 132°53'E, ARRS Gulungul Creek, inlet to Gulungul Billabong, 20 Apr 1989, A. Wells and P. Suter (NMV); 1 male, Litchfield National Park, Florence Falls, 9 Apr 1991, Horak, Wells and Upton (NTM); 1 male, 12°42'S, 130°58'E, Berry Springs, 9 Apr 1991, Wells and Horak (NTM); numerous males, females, 12°42'S, 132°57'E, Kakadu National Park, Magela Creek, OSS Site 009, 24 Apr 1991, Wells and Webber (NTM); 1 male, Little Baroalba Creek, 25–26 Apr 1991, Wells and Webber (NTM); 4 males, 1 female, Jabiru Town Lake, 13 May 1991, C. Humphrey (ANIC); 1 male, Jabiru Town Lake, 30 May 1991, Wells and Webber (NMV); 1 male, 1 female, 12°48'S, 132°49'E, Kakadu National Park, Baroalba Springs, 16 Aug 1992, Wells and Webber (NTM); 1 male, 13°16'S, 132°49'E, Kakadu National Park, Jim Jim Falls, camp site, 13 Aug 1996, I. Edwards (NMV). WA: 2 males, Drysdale R. National Park via Carson R. Station, 14°37'S, 125°56'E, 31 Aug 1996, I. Edwards (NMV); 2 males, 1 female, Drysdale R. Crossing, Kalumbaru Rd, 15°42'S, 126°22'E, 28 Aug 1996, I. Edwards (NMV). Qld: numerous males, females, Palmer R., 20 Jun 1971, E.F. Riek (ANIC); 1 male, Mulgrave R., W of Gordonvale, 29 Apr 1979, A. Wells (NMV).

Diagnosis. 1 of several Australian species with distinctively spotted wings that give a somewhat moth-like appearance. In general appearance resembling *O. hemerobioides* McLachlan, 1866 and *O. dostinei* Wells, 2004, but distinguished from those 2 *laustra*-group species by having males with stout inferior appendages, and the phallus with a slender internal paramere.

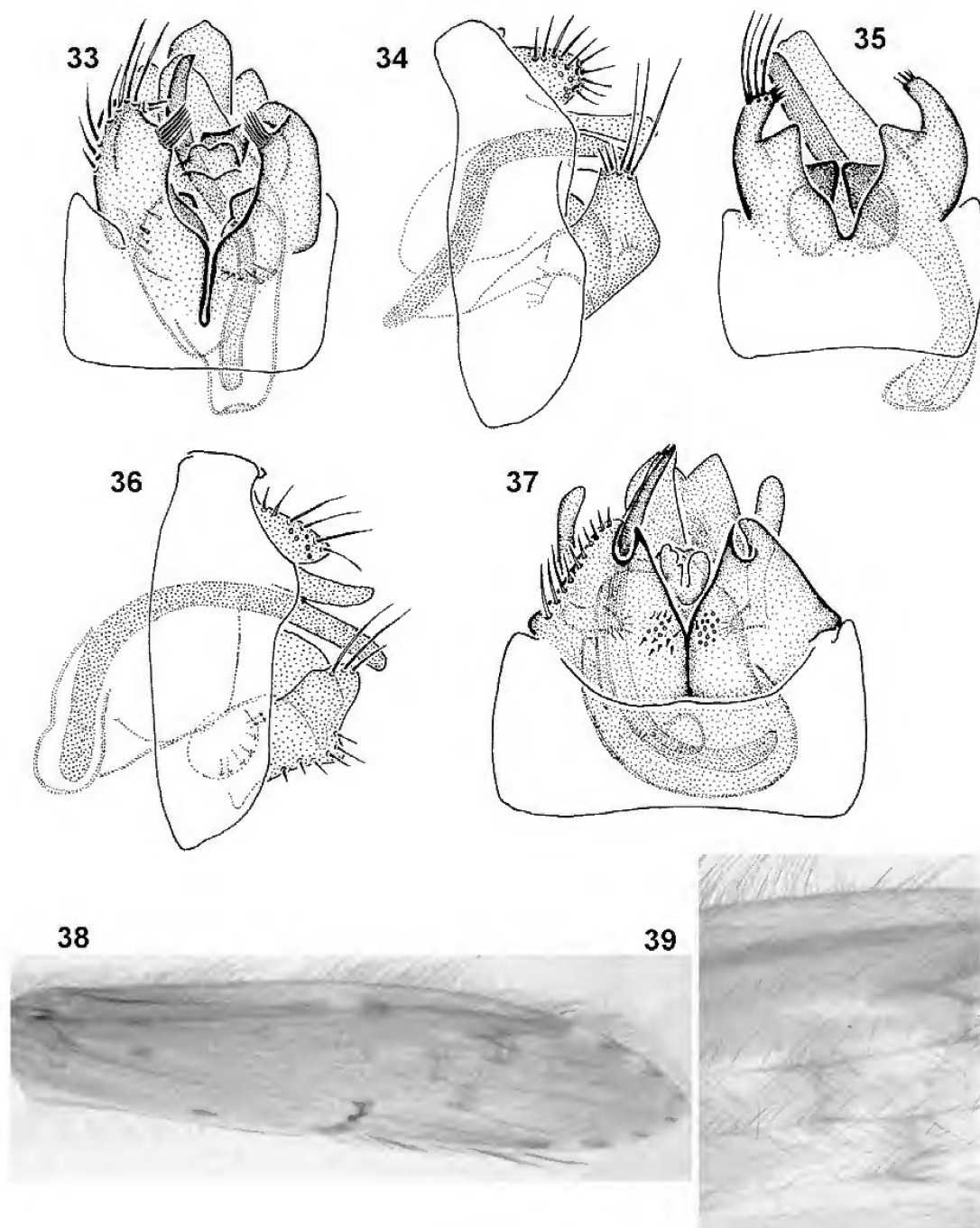
Description. Male. Wings of typical shape, without scales, but with pattern of spots, and long downy hair on veins. Anterior wing length 5.7–6.0 mm. Abdominal segment IX narrow mid-ventrally, with pronounced lateral lobes, segment X broad-based, triangular in dorsal view, slender, tapered in lateral view. Genitalia, see figs 27–29. Pre-anal appendages rounded apically. Phallus stout, short; aedeagus membranous with a sclerotised band apically forming a sharp 'beak' in lateral view; paramere slender, in lateral view strongly curved, slightly sinuous in dorsal and ventral view. Inferior appendages stout at



Figures 25, 26, *Oecetis geniculata* sp. nov., male genitalia in ventral and dorsal views.

Figures 27–29, *Oecetis litua* sp. nov., male genitalia in ventral, lateral and dorsal views.

Figures 30–32, *Oecetis jenniae* sp. nov., male genitalia in dorsal, ventral and lateral views.



Figures 33, 34, *Oecetis mouldsi* sp. nov., male genitalia in ventral and lateral views.

Figures 35, 36, *Oecetis theischingeri* sp. nov., male genitalia in ventral and lateral views.

Figures 37–39, *Oecetis australis* (Banks): 37, male genitalia in ventral view; 38, forewing; 39, downy hair on wing veins.

base, the mesial ventral margins closely adpressed for 1st half length, then abruptly excavated such that the appendages taper to conical lobes distally; in lateral view quite irregular in shape, broadest medially; dorsal pouch reduced to an angled row of stout setae in basal part of appendage.

Distribution. Known from the north of NT and northern Qld, and from 1 sample from northern WA.

Remarks. Within the *pechana*-group, this species is distinctive in its wing pattern and colouration. Yet the paramere and vestiges of the basi-dorsal pocket on the inferior appendages, clearly place it with other *pechana*-group species.

Etymology. The name is derived from the Latin — *lituus*, a curved staff, being descriptive of the paramere of the phallus in lateral view.

Oecetis jenniae sp. nov.

Figures 30–32, 66

Material examined. Holotype. Male, NT, 12°42'S, 130°58'E, Berry Springs, 31 Mar 1992, Wells (ANIC).

Paratypes. NT: 18 males, 17 females, same data as for holotype (ANIC, NMV); 42 males, 22 females, same locality, 17 May 1992, Wells (NTM).

Other material. 105 samples, some comprising numerous specimens, from NT, WA, Qld and NSW (one sample only).

Diagnosis. *Oecetis jenniae* resembles *O. mouldsi*, having similar male genitalia; however, it lacks a prominent apico-dorsal lobe, and has wing venation of a more normal *pechana* type, the veins not particularly emphasised. In having wing scales and in the pattern of wing markings, *O. jenniae* resembles *O. pechana*, but the male inferior appendages are wider than long and not clasper-shaped, features shared with *O. theischingeri* from which it is distinguished by lacking an apico-mesial lobe on the inferior appendages. The inferior appendages of this species resemble most closely those of *O. burtoni* and *O. quadrula*, but both of those species have long downy vestiture on the male wing and no scales.

Description. Male. Wings with vestiture short, pattern of dark areas at vein anastomoses and at margin; forewing with a patch of scales, which may be narrow or broad. Anterior wing length, 3.9–4.7 mm. Abdominal tergites II–IV darkly sclerotised, segment IX annulate, segment X short, rounded in ventral view, slender in lateral view. Genitalia, see figs 30–32. Pre-anal appendages rounded apically. Phallus about length of 2.5 to 3 abdominal segments; paramere S-shaped in ventral view, in lateral view arched dorsally. Inferior appendages stout, subquadrate in ventral view, with a short dorso-lateral lobe, basi-dorsal pouch present.

Distribution. Widespread in the north of the continent, but also occurring in the south-east of Qld, west of the divide in central NSW, and in the Pilbara region of WA.

Etymology. Named for Jenni Webber.

Remarks. *Oecetis jenniae* as recognised here is rather variable in features of male genitalia and in the breadth of the scale

patches on the male wing. Most specimens from across northern Australia conform to the type specimen from the north of the Northern Territory in having a broad scale patch on the forewing, and the apex of the dorsal lobe of the inferior appendages rounded, rather than acuminate. Some specimens from north-western Western Australia have only a narrow scale patch on the forewing, and the apex of the dorsal lobe of the inferior appendages acuminate, rather than more rounded. For the present a single species is recognised; it is often abundant in light trap collections.

Oecetis mouldsi sp. nov.

Figures 33, 34, 67

Material examined. Holotype. Male, WA, Millstream, Fortescue R., S of Roeborne, 12 Nov 1978, M.B. and B.J. Moulds (NMV T-18842).

Paratypes. WA: 1 male, Drysdale R. headwaters, 30 km NW Mt Elizabeth HS, 30 Sep 1979, J. Blyth (NMV); 1 male, 20°18.48'S, 119°15.16'E, N Pilbara, de Grey R., 25 Apr 1992, P.S. Cranston and P.J. Gullan (ANIC); 5 males, 9 females, 18°06'S, 125°42'E, Geikie Gorge, 5 Oct 1996, I. Edwards (NMV). NT: 1 male, 2 females, 12°40'S, 132°53'E, Jabiru, Town Lake, 17 May 1991 Wells and Webber (ANIC).

Other material. WA: 15°12'S, 128°12'E, Spillway Creek, Ord R. Dam, 20 Feb 1977, J.E. Bishop (NMV); 1 male, 1 female, Spillway Creek, 3 Feb 1978, J.E. Bishop (NMV); 2 females, Limestone Gorge, 16°02'S, 130°23'E, 23–26 Jun 1986, M.B. Malipatil, Operation Raleigh 1986 (NMV); 1 male, Wickham R., 23 km downstream Humbert R. Station, 16°49'S, 131°28'E, 11 Jul 1986, I. Archibald, Operation Raleigh 1986 (NMV); 1 male, 17°01'S, 126°14'E, Bell Gorge, Melaleuca Hole, 13 Sep 1996, I. Edwards (NMV); 1 male, 16°58'S, 125°59'E, Moll Gorge, Hann R., 15 Sep 1996, I. Edwards (NMV). NT: 1 male, 5 km W of King R., SW of Katherine, 5 Feb 1977, M.S. and B.J. Moulds (NMV); 1 male, 1 female, Katherine R. Gorge National Park, 13 Aug 1979, J.E. Blyth (NMV); 1 male, 3 km E of Howard Springs, 17 Aug 1979, J. Blyth (NMV); 3 males, 5 females, Jasper Creek, Victoria R. Downs Rd., 45 km SSE Timber Creek, 17 Sep 1979, J. Blyth (NMV); 4 males, 1 female, UDP Falls [Gunlom], 18–19 Jul 1980, M.B. Malipatil (NMV); 1 male, 4 females, Roderick Creek, Gregory National Park, 15°38'S, 131°22'E, 4–6 Jul 1986, I. Archibald, Operation Raleigh 1986 (NMV); 3 males, ARR, Magela Creek, 15 Feb 1991, A. Wells (NMV). Qld: 9 males, 5 females, Upper Ross R. below weir, S of Townsville, 8 May 1979, A. Wells (NMV); 1 male, 21°07'S, 148°38'E, Finch Hatton Gorge, 14 Nov 1982, T. Hinger (NMV).

Diagnosis. Closely resembling *O. jenniae*, but distinguished from that species by the more pronounced venation of the forewing, and in the male genitalia, by the inferior appendages in ventral view well separated mesially by a triangular apico-mesial process.

Description. Male. Wings with veins more strongly pronounced than usual for *pechana*-group species, with vestiture short and pattern of dark areas at vein anastomoses and at margin; forewing with a large patch of scales, length 6.0–6.3 mm. Abdominal tergites II–IV darkly sclerotised; segment IX annulate, postero-lateral margin produced slightly, forming a short lateral lobe; segment X membranous, slender in lateral view. Genitalia, see figs 33, 34. Pre-anal appendages rounded apically. Phallus about length of 2 abdominal segments, in

lateral view with paramere arched dorsally. Inferior appendages with a basi-dorsal pouch; in ventral view broad-based, with slender dorso-lateral lobe, and a triangular process near base on mesial margin; in lateral view, stout.

Distribution. From north-western WA to the north of the NT, and from 2 localities in north-eastern Qld.

Remarks. Superficially males of this species resemble those of *O. jenniae*, with which they are often collected, but they are clearly differentiated from that species by the more pronounced wing venation, and narrower inferior appendages.

Etymology. Named for Max Moulds.

***Oecetis theischingeri* sp. nov.**

Figures 35, 36, 68

Material examined. Holotype. Male, Qld, Booloumba Creek, 8 km SW of Kenilworth, 26°39'S, 152°39'E, 12 Dec 1984, G. Theischinger (NMV T-18843, on slide).

Paratypes. Qld: 4 males, same data as for holotype (NMV, 1 on slide); 1 male, Finch Hatton Gorge, 21°07'S, 148°38'E, 14 Nov 1982, T. Hinger (NMV, on slide); 13 males, Strathpine, nr Brisbane, 27°19'S, 153°00'E, 3 Dec 1984, G. Theischinger (NMV, 1 male on slide).

Other material. Qld: 1 male, 1 female, Upper Brookfield nr Brisbane, 4 Apr 1967, N. Dobrotworsky (NMV); 1 male, West Claudie R., 17 Sep 1974, M.S. Moulds (NMV); 1 male, same locality and collector, 30 Sep 1974 (NMV); 1 male, Middle Claudie R., Iron Range, 29 Sep 1974, M.S. Moulds (NMV); 12 males, 1 female, same locality and collector, 2–9 Oct 1974 (NMV); 2 males, same locality and collector, 23 Oct 1974 (NMV); 1 male, Funnel Creek, 53 km SW of Sarina, 4 Jan 1975, M.S. Moulds (NMV); 1 male, 1 female, Bulimba Creek, Site 5, Boorabbin Park, 9 Oct 1979, J.C. Cardale (ANIC); 2 males, Bulimba Creek, near Brisbane, Site R1, Kimmex Street riffle, 23 Oct 1979, [collector not given], (NMV); 4 males, Bulimba Creek, near Brisbane, Site R3, Willowbend lawns, 13 Mar 1980, A. Neboiss (NMV); 1 male, Obi Obi Creek, 8 km SW of Mapleton, 23 Oct 1980, A. Neboiss (NMV); 1 male, 7 females, Coondoo Creek, 30 km NE Gympie, Toolara State Forest, 28 Oct 1980, A. Neboiss (NMV); 1 male, 28°03'S, 152°24'E, Cunninghams Gap, Western Fall, 1 Sep 1984, G. Theischinger (NMV). NSW: 1 male, Kings Gap, S of Sandy Hollow, 5 Dec 1976, G. Daniels (NMV). Vic.: 1 male, Dartmouth R. Survey, Stoney Creek, 14 Feb 1973, Loc VB (NMV) [doubtful record].

Diagnosis. Resembling *O. jenniae* and *O. mouldsi* in having short stout inferior appendages, but distinguished by having the apico-mesial angle of the inferior appendages triangular, and triangular apico-mesial lobes on the inferior appendages. In the latter feature, *O. theischingeri* resembles *O. australis*; but *O. australis* is clearly distinct in having the apico-mesial lobes on the inferior appendages with apices acute and wings with vestiture downy.

Description. Male. Wings with vestiture short, pattern of dark areas at vein anastomoses and at margin; forewing with a large patch of scales. Anterior wing length, 5.0–5.2 mm. Abdominal tergites II–IV darkly sclerotised; abdominal segment IX annulate; segment X elongate-triangular in dorsal view, stout in lateral view, apically capped by a cluster of short setae. Genitalia, see figs 35, 36. Pre-anal appendages almond-shaped.

Phallus about length of 2–3 abdominal segments, paramere more sinuous than arched. Inferior appendages wide basally in ventral view with a triangular apico-mesial lobe; in lateral view stoutly rounded dorsally; a basi-dorsal pouch present.

Distribution. Known from north-, central- and south-eastern Qld and from 1 site in NSW. A single specimen bearing locality data of Vic. is undoubtedly this species, but as it is the only specimen from as far south, despite intensive collecting in that area, it is considered a doubtful record until verified by further collecting.

Etymology. Named for Gunther Theischinger.

***Oecetis australis* Banks**

Figures 37–39, 69

Oecetina australis Banks, 1920: 350, pls 1–7. —Mosely and Kimmins, 1953: 305. Neboiss, 1977: 145, figs 777–783. Neboiss, 1979: 840.

Holotype. Male, Vic., Melbourne ('Thorey') (ANIC, ex MCZ), examined.

Oecetis situlus Korboot, 1964: 32, figs 1–7 (synonymised by Neboiss, 1987: 139).

Holotype. Male, Qld, Cedar Creek, Mt Tamborine (QM).

Material examined. Ninety-two samples from Qld, Vic., NSW, Tas., SA and the NT.

Diagnosis. In males closely resembling *O. burtoni* in wing form, and most similar to *O. theischingeri* in form of the inferior appendages, but distinguished from both species by the acute ventro-mesial processes on the inferior appendages and from the latter by the downy vestiture on the inferior appendages, the acute apices on the ventro-mesial processes and the whip-like flagellum into which the paramere of the phallus extends.

Forewing length, 6.4–7.0 mm.

Distribution. Widespread in eastern Australia, from Tas. to northern Qld and also collected from Kangaroo I., SA, and the north-west of the NT.

***Oecetis quadrula* sp. nov.**

Figures 40–42, 70

Material examined. Holotype. Male, NT, Kakadu National Park, UDP Falls, 7 Sep 1979, J. Blyth (NMV T-18844, on slide).

Paratypes. NT: 1 male, Litchfield National Park, Florence Falls, 9 Apr 1991, Horak, Upton and Wells (ANIC); 1 male, Jabiru Town Lake, 13 May 1991, C. Humphrey (ANIC); 1 male, Kakadu National Park, Baroalba Springs, 4 Oct 1991, Wells and Webber (NTM); 1 male, same locality, 16 Jan 1992, Wells, Webber and Bickel (NTM); 1 male, Magela Creek Site 009, 3 Mar 1992, A. Wells (NTM).

Other material. NT: 1 male, Muirella Park, 12 Oct 1972, J.C. Cardale (ANIC); 1 male, 12°17'S, 133°13'E, Birraduk Ck, 18 km E by N of Oenpelli, 4–5 Jun 1973, J.C. Cardale (ANIC); 1 male, 12°31'S, 132°54'E, 9 km N by E of Mudginberri HS, 10–11 Jun 1973, J.C. Cardale (ANIC); 1 male, 12°50'S, 132°51'E, 16 km E by N of Mt Cahill, 16 Jun 1973, J.C. Cardale (ANIC); 1 male, 16°25'S, 136°05'E, 45 km SW by S of Borrooloola, 5 Nov 1975, J.C. Cardale (ANIC); male, Jim Jim Creek, 3 km below falls, Kakadu National Park, 1 Sep 1979, J. Blyth (NMV, on slide); male, South Alligator R. at

UDP Falls [Gunlom], 7 Sep 1979, J. Blyth (NMV, on slide); 1 male, ARR, creek 5 km W of OSS South Alligator Field Station, 19 Apr 1989, Wells and Suter (NMV); 1 male, Melville I., Andranangoo Creek, 11°31'S, 130°54'E, 8 Oct 1996, G.R. Brown (NTM); 1 male, Melville I., Maxwell Creek, 11°33'S, 130°35'E, 14 Oct 1996, G.R. Brown (NTM); 1 male, same locality and collector, 15 Oct 1996 (NTM). WA: numerous males, females, 15°02'S, 126°55'E, Drysdale R., 3–5 Jul 1975, I.B.F. Common (ANIC); numerous males, females, 15°02'S, 126°55'E, Drysdale R., 3–8 Aug 1975, I.B.F. Common and M.S. Upton (ANIC); male, Mitchell Plateau, Camp Creek, 31 Jan 1978, J.E. Bishop (NMV, on slide); male, Mitchell Plateau, Camp Creek at Crusher, 15 Feb 1979, J.E. Bishop (NMV, on slide); 3 males, Mitchell Plateau, at Mining Camp, 14°49'S, 125°50'E, 9–19 May 1983, J.C. Cardale (ANIC); 1 male, Kimberley, Mt Barnett Station, Manning Gorge, 30 Apr 1992, P.S. Cranston (ANIC); 1 male, 15°55'S, 127°56'E, El Questro Station, Chamberlain R. pool, 26 Aug 1996, I. Edwards (NMV); numerous males, females, 15°42'S, 126°22'E, Drysdale R. Crossing, Kalumburu Road, 28 Aug 1996, I. Edwards (NMV); 2 males, 14°54'S, 126°12'E, King Edward R., 3 Sep 1996, I. Edwards (NMV); 1 male, 16°40'S, 125°56'E, Manning R. near Mt Barnett, 8 Sep 1996, I. Edwards (NMV). Qld: 1 male, The Crater, Atherton Tableland, 25 Apr 1970, S.R. Curtis (ANIC); numerous males, females, Tewah Creek, Tin Can Bay, 17–18 Oct 1971, S.R. Monteith (ANIC); 1 male, Upper Freshwater Creek, Whitfield Range near Cairns, 15 Dec 1974, Moulds (NMV, on slide); 1 male, Mulgrave R. W of Gordonvale, 29 Apr 1979, Wells (NMV); 1 male, 15°12'S, 143°52'E, Hann R. NW by W of Laura, 27 Jun 1986, J.C. Cardale (ANIC). NSW: 4 males, 8 females, Wallagarough R., Princes Highway bridge, 29 Jan 1975, A. Neboiss (NMV). Vic.: 1 male, Wigan R., 8 km S Princes Hwy, 30 Jan 1975, A. Neboiss (NMV, slide); 1 male, Tanjil R. near Old Tanjil, S34, Latrobe C. Survey, 5 Feb 1980 (NMV).

Diagnosis. In the male, resembling *O. australis* and *O. burtoni* in having long downy vestiture on the wings and no scales, but distinguished by absence of acute ventro-mesial processes on the inferior appendages, and inferior appendages short and stout in ventral view, tapered distally in lateral view, phallus short and beak-like, with a short slightly curved paramere. The form of the inferior appendages of this species is similar to *O. jenniae*, but the phallus is far shorter, its paramere short and slender.

Description. Male. Wings rounded apically, with long hair on veins; forewing without scales, length 4.6–7.0 mm. Antennae with a brush of long setae on leading edge of segments. Abdominal segments 3–5 with tergites sclerotised; segment IX narrow, lateral angles produced, segment X elongate cone-shaped in ventral view, in lateral view elongate, rounded apically and with a small triangular ventral process. Genitalia, see figs 40–42. Pre-anal appendages short, rounded, phallus scarcely longer than wide, with membranous apex of aedeagus folded and down-turned; a short, slightly curved paramere present. Inferior appendages in ventral view subquadrate, with apico-lateral lobes short, convergent; in lateral view, simple, straight, tapered at apex, without basi-dorsal pouch.

Distribution. Found across northern Australia, from WA, NT and Qld, and from south-eastern Vic.

Remarks. With a dense brush of setae on the leading edge of the antennae, antennae erect (at least in spirit material), and long maxillary palpi, males of this species look particularly moth-like. Material here referred to *O. quadrula* shows variability in genitalic form, but a conservative approach is taken in assigning all to a single species as examination of more material from the south-east of the continent is required to justify recognition of two distinct morpho-species.

Etymology: Derived from the Latin, *quadra* — square, for the shape of the inferior appendages in ventral view.

Oecetis buitenzorgensis Ulmer

Figures 43–45, 71

Oecetis buitenzorgensis Ulmer, 1951: 459, figs 708–712.

Holotype. Java (ZMB).

Material examined. Qld: 7 males, Little Mulgrave R., 28 Jun 1971, E.F. Riek (ANIC); 3 males, West Claudie R., Iron Range, 17 Sep 1974, M.S. Moulds (NMV, 1 male on slide); 1 male, Middle Claudie R., Iron Range, 2–9 Oct 1974, M.S. Moulds (NMV); 1 male, Mcleod R., 15 km W of Mt Carbine, 22–23 Jun 1975, S.R. Monteith (ANIC); 3 males, 1 female, Mulgrave R., W of Gordonvale, 29 Apr 1979, A. Wells (NMV: WTH 1387, 1 male on slide); 2 males, 5 km W by N Rounded Hill nr Hope Vale Mission, 15°17'S, 145°10'E, 7 Oct 1980, J.C. Cardale (ANIC); 1 male, 3 km ENE Mt Tozer, 12°44'S, 143°14'E, 2 Jul 1986, J.C. Cardale (ANIC); 4 males, 2 females, 9 km ENE Mt Tozer, 12°43'S, 143°17'E, 5–10 Jul 1986, J.C. Cardale (ANIC); 3 males, 12°44'S, 143°16'E, Claudie R., Iron Range National Park, 25 km NW Lockhart R., 10 Nov 1988, K. Walker (NMV); 3 males, 21 females, Bertie Creek, 1 km SE Heathlands HS, 4 Feb 1992, D. Cartwright and A. Wells (QM); 1 male, 19 females, Gunshot Creek at Telegraph Crossing, 18 Feb 1992, D. Cartwright and A. Wells (QM); 4 males, 2 females, Kearney Falls, Goldsborough Valley, 26–27 Mar 1997, G. Theischinger and L. Muller (ANIC, 1 male on slide); 7 males, Cape York Peninsula, Iron Range, Rainforest Camping Ground, 6 Oct 2002, G. Theischinger (ANIC).

Diagnosis. Wings with long downy hair and, as in *O. burtoni* and *O. australis*, male forewings lack scale patches. Males are distinguished by genitalic features (figs 43–45): shape of the inferior appendages which are stout and elongate in ventral aspect, in lateral view narrowly tapered apically and with a dorso-mesial expansion; and pre-anal lobes that are broadly almond-shaped. Male forewing length, 3.9–5.5 mm.

Distribution. Known in Australia only from far north-eastern Qld. Described from Bogor (= Buitenzorg), Java, and recorded subsequently from New Guinea (Kimmings, 1962, from Kokoda, Papua New Guinea).

Remarks. *Oecetis buitenzorgensis* is one of several Oriental/New Guinean species recorded from far northern Queensland. Chen, 1992 placing *O. buitenzorgensis* with a group of Palearctic and Oriental species (African, Indian and Thai), commented that it is a *nomen dubium*, not recognisable from Ulmer's illustrations. However, the north-eastern Australian specimens agree closely with Ulmer's figures, and conform well to other members of the *pechana*-group as recognised here.

Oecetis burtoni Neboiss

Figures 46–48, 72

Oecetis burtoni Neboiss, 1979: 841, figs 37–40.

Holotype. Male, Qld, Fraser I. (NMV T-5749).

Material examined. Qld: 1 male, Mossman Gorge, 16 Jun 1971, E.F. Riek (ANIC); numerous males, females, Tewah Creek, Tin Can Bay, 17–18 Oct 1971, S.R. Monteith (ANIC); 4 males, Iron Range, West Claudie R., 17 Sep 1974, M. Moulds (NMV); 1 male, Iron Range, Middle Claudie R., 19 Sep 1974, M. Moulds (NMV); 1 male, Cap Creek, Mt Finlayson Range, S of Cooktown, 23 Nov 1974, M.S. Moulds (NMV); numerous males, females, Lake Wabby, S end Fraser I., 14 Dec 1975, H. Burton (NMV); 1 male, Bluewater State Forest, S end Paluma Range WNW of Townsville, 31 Jan 1981, M.S. and B.J. Moulds (NMV); 4 males, 5 females, Seary's Creek Rainbow Beach, 25°58'S, 153°04'E, 6 Dec 1984, G. Theischinger (ANIC); 5 males, 6 females, 12°44'S, 143°35'E, Claudie R., Iron Range National Park, 25 km NW Lockhart, 10 Nov 1988, K. Walker (NMV); 3 males, 5 females, 11°45'S, 142°35'E, Heathlands, 15–26 Jan 1992, I. Naumann and T. Weir (ANIC); 6 males, 2 females, Bertie Creek, 1 km SE Heathlands HS, 4 Feb 1992, D. Cartwright and A. Wells (NMV); 3 males, 6 females, Tributary of Bertie Creek, 250 m SW Heathlands HS, 4 Feb 1992, D. Cartwright and A. Wells (NMV); 1 male, Eliot Creek upstream junction Canal Creek, 6 Feb 1992, D. Cartwright and A. Wells (NMV); 1 male, Dulhunty R. at Telegraph Crossing, 11°50'S, 142°30'E, 8–9 Feb 1992, D. Cartwright and A. Wells (NMV); 29 males, 4 females, Dulhunty R., at Telegraph Crossing, 10 Feb 1992, D. Cartwright and A. Wells (NTM); 8 males, 13 females, Tributary of Bertie Creek, 250 m SW Heathlands HS, 11 Feb 1992, D. Cartwright and A. Wells (NMV); 5 males, 7 females, Tributary of Bertie Creek, 250 m SW Heathlands HS, 11 Feb 1992, D. Cartwright and A. Wells (NMV); numerous males, females, Cockatoo Creek and McDonnell Creek junction, 11°39'S, 142°28'E, 13 Feb 1992, D. Cartwright and A. Wells (NMV); 1 male, 1 female, Gunshot Creek at Telegraph Crossing, 18 Feb 1992, D. Cartwright and A. Wells (NMV); 1 male, Cape York Peninsula, Heathlands, Bertie Creek, 23 Mar 1993, M. Crossland (ANIC); 2 males, 3 females, Gunshot Creek at Telegraph Crossing, M. Crossland, 4–5 Apr 1993 (ANIC); numerous males, females, Gunshot Creek at Telegraph Crossing, M. Crossland, 10–11 Apr 1993 (ANIC). WA: 3 males, 1 female, Drysdale R. at Kalumburu Road crossing, Kimberley, 28 Sep 1979, J. Blyth (NMV). NT: 2 males, 2 females, Devil Devil Creek, 70 km SW of Daly R. Mission, 23 Aug 1979, J. Blyth (NMV).

Diagnosis. In lacking wing scales in the male, but having long downy vestiture on the wings, this species resembles *O. australis*, *O. quadrula* and *O. buitenzorgensis*, but in features of male genitalia it more closely resembles *O. theischingeri* from which it is distinguished by the very short phallus with an equally short paramere, absence of the triangular process apico-mesially on inferior appendages and of the dorso-basal pouch on inferior appendages. Male forewing length, 4.0–4.6 mm.

Distribution. Quite widespread around coastal areas of northern Australia, although not very commonly collected. Possibly records represent more than 1 species, as some variability is recognised in form of the inferior appendages and tergite X. At present this is considered too slight to warrant designation of separate morpho-species.

Oecetis searica sp. nov.

Figures 49, 50, 73

Material examined. Holotype. Male, Qld, Seary's Creek Rainbow Beach, 25°58'S, 153°04'E, 6 Jan 1986, G. Theischinger (NMV T-18845, on slide).

Paratypes. 3 males, same locality and collector as for holotype, 6 Dec 1984 (NMV, 1 on slide).

Diagnosis. One of the species with scales on the male forewing, but distinguished from others by the medium length paramere in the phallus strongly arched dorsally and elongate inferior appendages which, in lateral view, are rod-like, taper gradually toward the apex and lack a dorsal lobe.

Description. Male. Wings with short hair on veins, forewing with a patch of scales. Anterior wing length, 4.3 mm. Abdominal segment IX broader dorsally, with pronounced lateral lobes, segment X triangular in dorsal view. Genitalia, see figs 49, 50. Pre-anal appendages longer than wide. Phallus about length of 1.5 abdominal segments; paramere strongly arched dorsally. Inferior appendages clasper-shaped in ventral view, stout basally, narrow distally, rounded apically, in lateral view elongate, with length almost 4 times as long as basal width, tapered distally, without basi-dorsal pocket.

Distribution. Known only from the type locality in north-eastern Qld.

Etymology. Named for the type locality.

Oecetis ada sp. nov.

Figures 51–53, 74

Material examined. Holotype. Male, NT, Litchfield National Park, Ada Creek, at jump up, 24–25 Jun 1992, Wells and Webber (NTM).

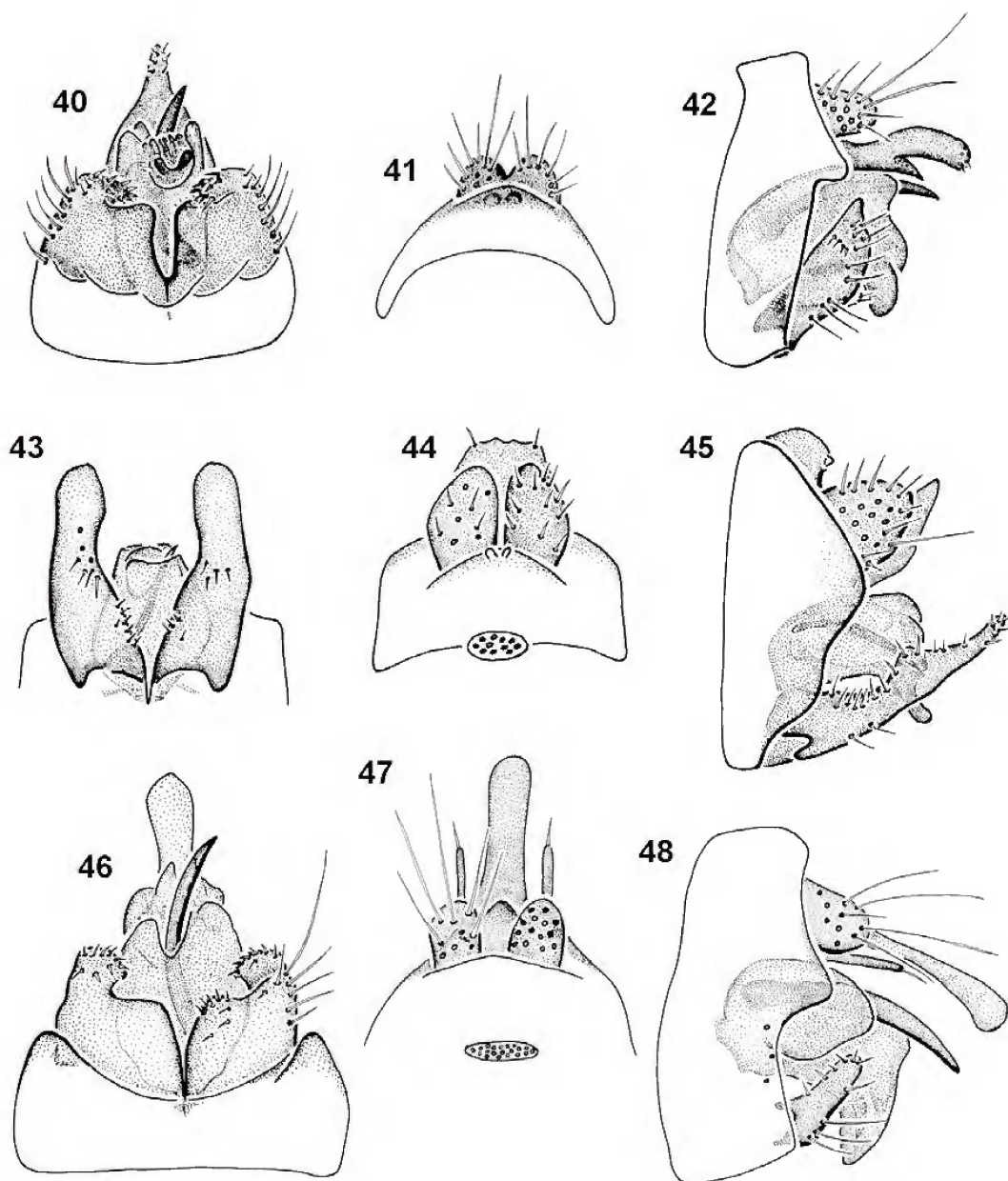
Diagnosis. The patches of wing scales clearly place this species in the *pechana*-group, but, like *O. gilva*, it lacks a paramere in the very short phallus; and the pre-anal appendages are unusually long for a *pechana*-group species, being over 3 times longer than wide.

Description. Wings with short hair on veins, forewing with a patch of scales. Male anterior wing length, 6.6 mm. Abdominal segment IX narrow, lateral angles produced; segment X about as long as pre-anal appendages, slender in dorsal view. Genitalia, see figs 51–53. Pre-anal appendages elongate-ovoid. Inferior appendages stout at base, in ventral view tapered to rounded apices; in lateral view, with a triangular basi-dorsal lobe, and basi-dorsal pouch. Phallus about length of 1 abdominal segment, with a sharply returned, pointed apex; paramere absent.

Distribution. Known only from the holotype male from the north of the NT.

Etymology. Named for the type locality.

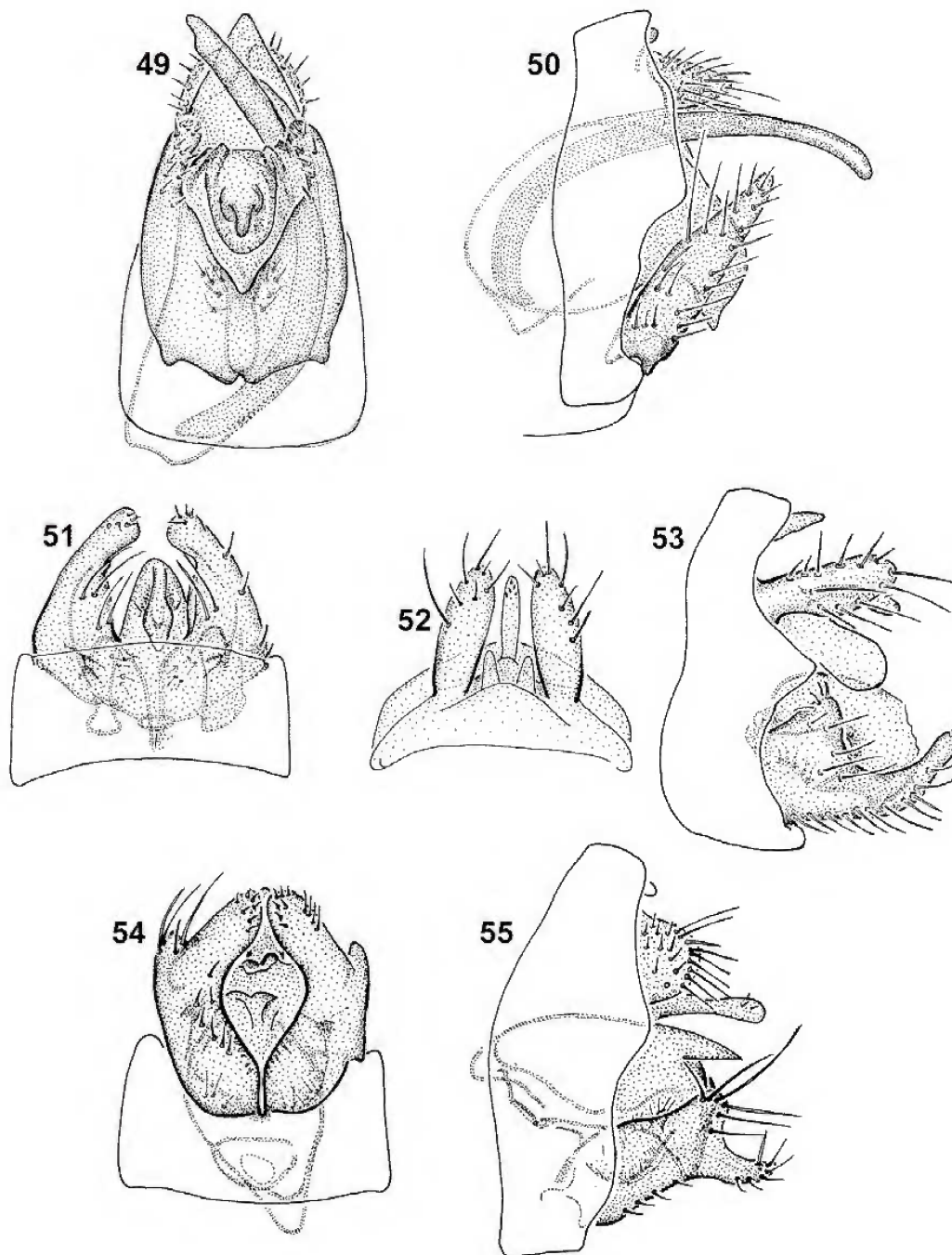
Remarks. Although this species lacks a paramere it clearly groups with *pechana*-group species on the basis of the general form of the phallus, wing venation and presence of scale patches.



Figures 40–42, *Oecetis quadrula* sp. nov., male genitalia in ventral, dorsal and lateral views.

Figures 43–45, *Oecetis buitenzorgensis* Ulmer, male genitalia in ventral, dorsal and lateral views.

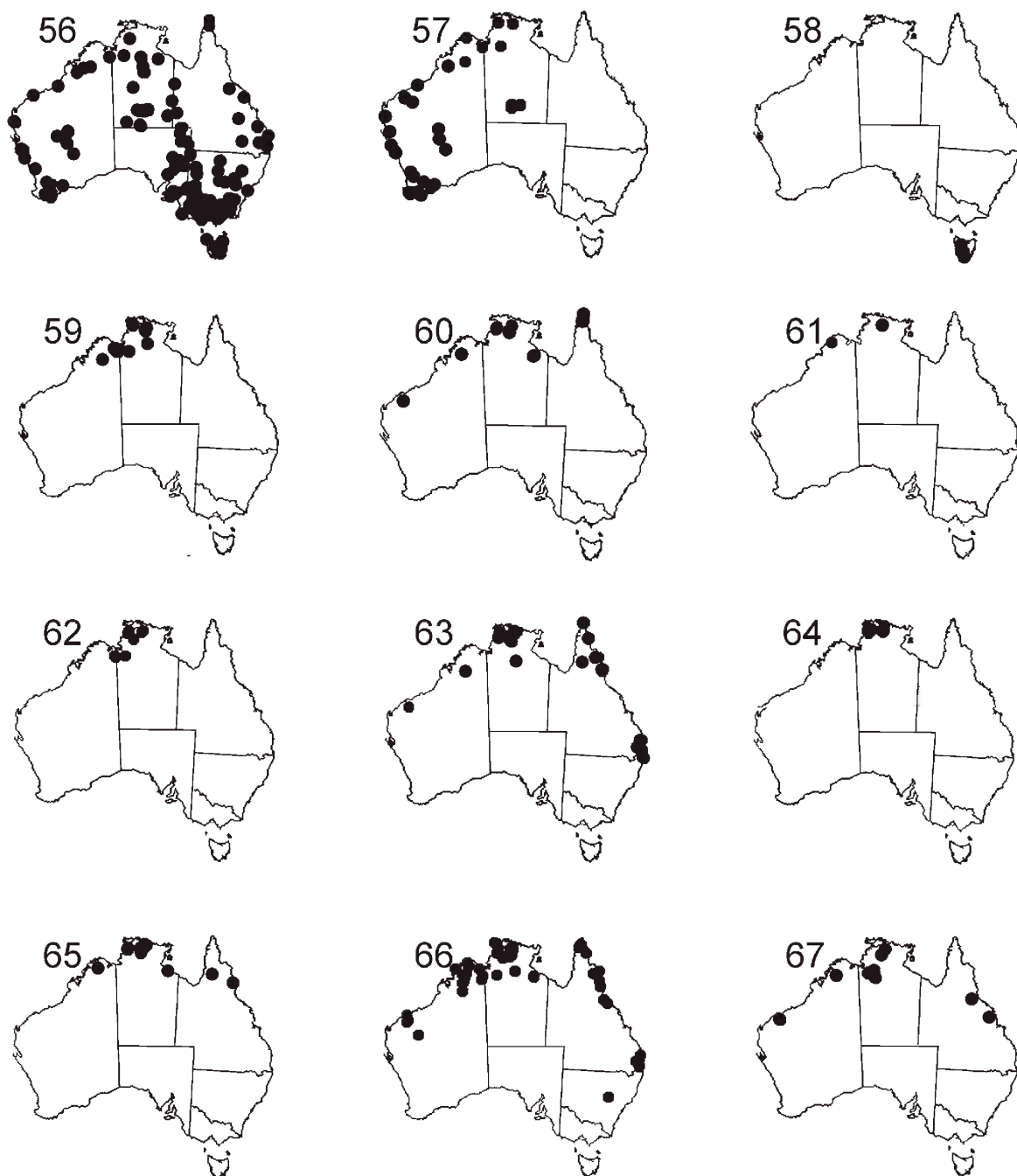
Figures 46–48, *Oecetis burtoni* Neboiss, male genitalia in ventral, dorsal and lateral views.



Figures 49, 50, *Oecetis searica* sp. nov., male genitalia in ventral and lateral views.

Figures 51–53, *Oecetis ada* sp. nov., male genitalia in ventral, dorsal and lateral views.

Figures 54, 55, *Oecetis gilva* Neboiss, male genitalia in ventral and lateral views.



Figures 56–67, Distribution of species within Australia: 56, *O. pechana* Mosely; 57, *O. walpolica* Neboiss; 58, *O. umbra* Neboiss; 59, *O. magelensis* sp. nov.; 60, *O. suteri* sp. nov.; 61, *O. radonensis* sp. nov.; 62, *O. humphreyi* sp. nov.; 63, *O. kateae* sp. nov.; 64, *O. geniculata* sp. nov.; 65, *O. litua* sp. nov.; 66, *O. jenniae* sp. nov.; 67, *O. mouldsi* sp. nov.



Figures 68–75, Distribution of species within Australia: 68, *O. theischingeri* sp. nov.; 69, *O. australis* (Banks); 70, *O. quadrula* sp. nov.; 71, *O. buitenzorgensis* Ulmer; 72, *O. burtoni* Neboiss; 73, *O. searica* sp. nov.; 74, *O. ada* sp. nov.; 75, *O. gilva* Neboiss.

Oecetis gilva Neboiss

Figures 54, 55, 75

Oecetis gilva Neboiss, 1977: 145, figs 774–776. —Neboiss, 1979: 840, figs 35, 36; Neboiss, 1986: 268.

Holotype. Male, Tas., South Esk R. near Evandale (NMV T-5491).

Material examined. Eighty-seven samples examined, from localities in south-eastern Australia; 2 samples examined from far north-eastern SA.

Diagnosis. In features of wing venation, pattern of markings, and male genitalia resembling *O. pechana* superficially, but wings broader and more rounded apically, and male generally without scales on anterior wing, inferior appendages tapered distally. This species lacks a paramere in the phallus, a feature shared with *O. ada* sp. nov., but unlike that species the phallosome forms a pale dorsal spine.

Revised description. Wings relatively broad, forewing length 9.1–9.6 mm, rounded apically, male forewing with or without

scales. Abdominal segments III–V with tergites well sclerotised; IX short; segment X narrow, membranous, rounded apically. Male genitalia; figs 54, 55. Pre-anal appendages short, rounded apically. Phallus about twice length of segment IX, beak-like apico-ventrally, without a paramere, but in lateral view extended in a short, pale apico-dorsal spine. Inferior appendages clasper-shaped in ventral view, with basi-dorsal dorsal pouch; in lateral view, expanded and rounded dorsally, tapered to acute apex.

Distribution. A common species in SE Australia, *O. gilva* occurs from northern NSW, throughout Vic., to the Flinders Ranges in SA and south to Tas.

Remarks. The diagnosis of *O. gilva* is expanded here to include the curious scaly winged form that has been collected together with *O. gilva*, s. str. from several lakes in Victoria. In all respects other than presence of patches on the wings, these animals appear to be identical. The winged forms could conceivably be hybrids between *O. gilva* and *O. pechana*. *O. gilva* is often abundant in still to slow waters; the larvae build tube cases of sand.

Oecetis lurida Kimmins

Oecetis lurida Kimmins in Mosely and Kimmins, 1953: 298, fig. 210. —Neboiss, 1986: 268.

Material examined. Holotype. Female, Broken Hill, NSW (BMNH).

Remarks. This species was described from a female with uniformly pale, unspotted wings and while it may eventually be found to be a senior synonym of *O. gilva*, which has been found in inland waters, *O. lurida* is probably best considered a doubtful name.

Nomen novum and new synonymy

The name *Oecetis kimberleyensis* nom. nov. is proposed to replace the name, *Oecetis dilata* Wells, 2004: 98, preoccupied by *O. dilata* Yang and Morse, 2000 (J. Morse, in litt.); and, following advice from H. Malicky (in litt.), *Oecetis cepaforma* Wells, 2004 is suppressed in synonymy with *Oecetis hemerobioides* McLachlan, 1866. This action extends into northern Australia the range of *O. hemerobioides*, described from Sulawesi (as Celebes) and recognised previously Chen, 1992 from Thailand and Malaysia through Indonesia and the Philippines to New Guinea. It is probable, too, that *O. oecetinellae* Mey, 1990 from the Philippines is also referable to this species.

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References

- Banks, N. 1920. New neuropteroid insects. Native and exotic. *Bulletin of the Museum of Comparative Zoology, Harvard* 64: 299–362, pls 1–7.
- Chen, Y.E. 1992. Revision of the *Oecetis* (Trichoptera: Leptoceridae) of the World. Unpublished PhD Thesis, Clemson University, South Carolina, USA.
- CSIRO. 1991. *Insects of Australia*. Vol. 2. Melbourne University Press: Melbourne. xvi + 1137 pp.
- Kimmins, D.E. 1962. Miss L. E. Cheeseman's expeditions to New Guinea. Trichoptera. *Bulletin of the British Museum of Natural History (Entomology)* 11: 99–187.
- Korboot, K. 1964. Four new species of caddis flies (Trichoptera) from Eastern Australia. *Journal of the Entomological Society of Queensland* 3: 32–41.
- McLachlan, R. 1866. Descriptions of new or little known genera and species of exotic Trichoptera, with observations on certain species described by Mr. F. Walker. *Transactions of the Royal Entomological Society of London* 3: 247–275.
- Mey, W. 1990. Neue Köcherfliegen von den Philippinen (Trichoptera). *Opuscula zoologica fluminensia* 57: 1–19.
- Mosely, M.E., and Kimmins, D.E. 1953. *The Trichoptera (caddis-flies) of Australia and New Zealand*. British Museum (Natural History): London 550 pp.
- Neboiss, A. 1977. A taxonomic and zoogeographic study of Tasmanian caddis-flies (Insecta: Trichoptera). *Memoirs of the National Museum of Victoria* 38: 1–208, 807 figs, 3 pls.
- Neboiss, A. 1979 [1978]. A review of caddis flies from three coastal islands of south-eastern Queensland (Insecta: Trichoptera). *Australian Journal of Marine and Freshwater Research* 29: 825–843.
- Neboiss, A. 1982. The caddis-flies (Trichoptera) of south-western Australia. *Australian Journal of Zoology* 30: 271–325.
- Neboiss, A. 1986. *Atlas of Trichoptera of the SW Pacific — Australian Region*. Dr W. Junk: Dordrecht. 286 pp.
- Neboiss, A. 1987. Identity of species of Trichoptera described by K. Korboot 1964–65 (Insecta). *Memoirs of the Museum of Victoria* 48: 131–140.
- Neboiss, A. 1989. The *Oecetis reticulata* species-group from the South-West Pacific area (Trichoptera: Leptoceridae). *Bijdragen tot de Dierkunde* 59: 191–202.
- Ulmer, G. 1951. Köcherfliegen (Trichopteren) von den Sunda-Inseln (Teil 1). *Archives für Hydrobiologie, Supplement* 19: 1–528.
- Wells, A. 2000. New Australian species of *Oecetis* allied to *O. complexa* Kimmins (Trichoptera: Leptoceridae). *Memoirs of Museum Victoria* 58: 77–88.
- Wells, A. 2004. The long-horned caddisfly genus *Oecetis* (Trichoptera: Leptoceridae) in Australia: two new species groups and 17 new species. *Memoirs of Museum Victoria* 61: 85–110.
- Yang, L., and Morse, J. 2000. Leptoceridae (Trichoptera) of the People's Republic of China. *Memoirs of the American Entomological Institute* 64: viii + 309 pp.